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Japan Report

(FOUO 59/81)



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POLITICAL AND SOCIOLOGICAL

SUZUKI POLITICS ANALYZED

Tokyo BUNGEI SHUNJU in Japanese Aug 81 pp 110-122

[Article by Ikuzo Tajiri, political affairs critic]

[Text] No Political Enemy for Time Being

They say his castle is built on sand. Perhaps so, but the political relationships surrounding Prime Minister Suzuki (see separate chart) appear to be surprisingly stable.

First, there is apparently no political enemy on the horizon, as seen from the Suzuki administration. Moreover, the opposition groups appear to be regarding it with a warm understanding. If the rumors that Suzuki will retire before his time is up is true, who will step forward to bring him down?

It is very doubtful whether it revealed his true intention, but former Prime Minister Tanaka, the most powerful figure in political circles, was recently quoted in the newspapers as follows: "You know, Suzuki was elected by a unanimous party vote and, unless he himself decides to quit, his premiership is based on the premise of a long-term regime. He was urged by everyone to run, although he had declined, so we must support him to the end. I believe absolutely that there is no one who would pull him down. If there is, that persons' political career would be ruined. Suzuki is not stumbling at all." (YOMIURI SHIMBUN 21 June)

Such hyperbole makes one wonder. The same Tanaka was reported six months ago to have said, "We recommended Zenko (Suzuki), but he turned out to be a misfit." Perhaps Tanaka himself might turn out to be the very ringleader of a "Movement to topple Suzuki." The future is difficult to predict.

However, the portion in Tanaka's statement which says, "Unless Suzuki himself decides to quit," is true. Since there is no political adversary in sight, it depends on whether conditions could be created under which Suzuki would be forced to voluntarily announce his resignation. This could turn out to be a strong factor in Suzuki's favor, if he were to be pushed into a corner.

Eisaku Sato announced his resignation under comparatively benign conditions. Nevertheless, it was after a record reign of 7 years and 8 months, when the public had tired of the Sato government. When he was elected to his third term as party president (a full 6 years), even his brother Nobusuke Kishi recommended that he quite,

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saying, "It is enough. It's time to retire." Yet, he continued to reign for nearly another two years. It was therefore relatively easy for him to "resign."

Because subsequent administrations have been, without exception, plagued with political enemies and were shortlived, they were in effect built on sand. No one could predict that Kakuei Tanaka, who made an auspicious start with the restoration of Sino-Japanese diplomatic relations and boasted a support of over 60 percent, would succumb in 2 years and 5 months. He was criticized by Takeo Miki and Takeo Fukuda, and his government collapsed because of criticism against his money politics. During the next Miki administration, a "topple Miki movement" by the entire party began soon after his inauguration, and he walked a tight rope but persevered for 2 years.

Fukuda's chances were obstructed by Masayoshi Ohira. Ohira was exhausted by his political feud with Fukuda, and he died suddenly. Thus, although they were regarded as full-fledged regimes, they were both shortlived. The regimes were fraught with the unforeseen and dangerous vicissitudes of fate. Although the Suzuki administration could not possibly be an exception, it is difficult to predict whether it will be longlived or shortlived.

The Suzuki administration will welcome its first anniversary on 17 July. Since it is the halfway mark of the first term, talks can be expected to begin concerning a successor. Especially with his return home from the Japan-U.S. summit talks in mid-May as a watershed, the atmosphere within the Liberal Democratic Party (LDP) has suddenly changed. The erstwhile talk of his re-election has disappeared into thin air and has been replaced by talk of an early retirement.

Keys to Chart on p 111

- | | | |
|---------------------------------|-------------------------------------|----------------------------|
| (1) Political Correlation Chart | (9) Miyazawa | (17) New Liberal Club |
| (2) Nakasone | (10) Kishi | (18) Komeito Party |
| (3) Tanaka | (11) Nakagawa | (19) Japan Socialist Party |
| (4) Suzuki | (12) Miki | (20) Japan Communist Party |
| (5) Fukuda | (13) Rokusuke Tanaka | (21) Suzuki Administration |
| (6) Komoto | (14) Sonoda | (22) Close relationship |
| (7) Watanabe | (15) Democratic Socialist Party | (23) Ordinary relationship |
| (8) Sakurachi | (16) United Social Democratic Party | (24) Weak relationship |

Similarities Between Sato, Miki and Suzuki

Before making any judgment concerning the longevity of the Suzuki administration, I will attempt to typecast it. One can see it as a cross between the Sato and Miki administrations. Noboru Takeshita (former finance minister), a Tanaka faction cadre, pointed out the similarity between Sato and Suzuki as follows. "Mr. Suzuki is basically a cautious man. Although the Suzuki regime may give the impression of being unreliable, it survived the extraordinary Diet session (last fall) and it has gained confidence by formulating this year's budget (FY-81). I think it will continue to mature. Through my own experience, I feel that the Sato Cabinet, which was formed in November 1964, matured after undergoing the test in the Diet. There may be some people who find fault with Mr. Suzuki's approach to politics and with his outlook, but that is because he lacked the opportunity to explain his convictions before being inaugurated as prime minister and president to the LDP. In the past, an election

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was held for the party president, and the winner had a chance to explain his beliefs beforehand. Mr. Suzuki did not have such an opportunity. The Sato administration came into being with Mr. Ikeda's abdication. At the outset, Mr. Sato's interpellations in the Diet were read from a prepared text and he did not provide strong leadership to his followers. He resorted to 'wait-and-see' politics. It was similar to Mr. Suzuki's case."

Subsequently, political conditions changed considerably, and major problems arose in succession, including the difficult Japan-U.S. relations, administrative reform for which the Suzuki regime is "staking its political life," and the personnel changes in November which are bound to raise havoc. It is certainly true that Prime Minister Suzuki faces severe times. Nonetheless, Takeshita's theory is basically correct. Suzuki's "politics of harmony" places priority on overall peace rather than exercising leadership, and it is similar to Sato's "wait-and-see" politics. The main difference is that, as a landmark of the regime, administrative reform is for Suzuki what the return of Okinawa was to Sato.

The two men also share a common lack of political enemies within the LDP party. In Sato's case, soon after his inauguration as prime minister, his powerful rivals, Ichiro Kono, Bamboku Ono and others, died in succession, and he was afforded the opportunity to solidify the base for a long-lived regime. In Suzuki's case also, his regime started out with an unanimous and suprafactional support by the party (although not an aggressive support), and there was no powerful rival worth note.

Again, he was like Miki in two aspects: Tenacity and an astute strategy in winning public support. According to Michiharu Nakamura (vice president of the German Food Products Import Association), who is close to Suzuki as a junior alumnus of the Japan Fisheries Institute, "He is not necessarily a so-called 'nice guy.' Even today, people tend to see him in that light, but he is not so naive. He has always been lowkey and very inept in promoting himself, but he possesses the peculiar tenacity of a native of the Tohoku region. He never changes his attitude or posture, and always carries out what he proposes to do. He has managed the party for ten years as chairman of the party's general affairs, and is an expert in timing. He is more knowledgeable than anyone concerning party affairs."

Party members generally agree with this evaluation, although with slight variations. Suzuki's tenacity is considered "positive" in comparison to Miki's "negative" tenacity. They share a stubborn streak which is lacking in other powerful figures like Tanaka, Fukuda, Ohira and Nakasone.

Although Miki frequently had his back up against the wall where he would have been forced to quit, he never admitted it. At the climax of the "topple Miki movement" in September 1976, Miki dismissed the anti-Miki members of the Cabinet and dissolved the Diet. He took the tough stand of splitting the party and went to the voters for support. He thus persevered against the anti-Miki forces and stayed alive. It was the so-called "9-10 affair." Until he took responsibility for the defeat in the general elections in the same year, Miki prolonged the life of his administration, albeit for a short time. It is difficult to foresee the kind of crisis Suzuki will encounter in the future, but like Miki he will surely not give up easily. In such a case, he will probably like Miki give "public support" as his reason for hanging on. Moreover, unlike Miki, Suzuki does not maintain a factional position which puts the party majority in the opposition, but has the backing of the so-called "mainline faction" (KOCHIKAI), which gives him an advantage over Miki.

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Despite His Brand As a "Stupid Monarch"

Although Miki is a totally different type of man from either Sato or Miki, he would have a chance in prolonging his reign if he could combine the common traits of those astute men. An analysis of the character of the Suzuki administration would indicate at least such a possibility. Meanwhile, however, there are some glaring shortcomings in Suzuki, compared to Sato and Miki.

There are doubts cast on his fitness as a prime minister. Masayuki Fujio, a labor minister known for his sharp tongue, recently labeled him "a stupid monarch."

It is unclear as to which half of the label was given greater emphasis, but it cleverly expresses Suzuki's strengths and weaknesses. Soon after he became prime minister, Suzuki often stumbled in his speeches. He committed errors in his Diet interpellations concerning economic growth figures, and he addressed U.S. Ambassador Mansfield as "your Excellency, the President."

At the time, voices were frequently heard within and outside the LDP that "he doesn't even have figures and data on basic state management in his head. At this rate, his Cabinet won't last long." He assiduously memorized data written on cue cards by his secretary and read studiously from his notes in Diet interpellations in order not to be caught with mistakes.

Gradually acquiring self-confidence, he would before long expose his weakness concerning foreign affairs which is not one of his fortes. For example, there was the trouble over the Japan-U.S. joint statement and Foreign Minister Ito's resignation in assuming the responsibility. Also, the confrontation between Suzuki and the Foreign Ministry in which emotional struggle within the Suzuki faction became involved. These issues have become extremely refracted, but in effect his image of ignorance in foreign affairs bordering on "stupidity" remains.

Criticism toward Suzuki spewed forth from the LDP. For instance, Raizo Matsuno stated, "Suzuki simply does not understand. If Mr. Shigeru Yoshida, who was very particular concerning foreign affairs, was alive, he would have given him a loud scolding. Japan has always placed top priority on Japan-U.S. relations since the end of the war and, whenever the relations do not run smoothly, it acts as if it had a tumor in its aorta. Japan and the United States are separate nations and it is strange that one should criticize the other because it finds itself in a tight situation. To simply explain its position to the other should suffice. What it is doing may mend things for the time being, but it will bring grave problems in the future. Suzuki sees only the ups and downs of Japan-U.S. relations, and ends up making a series of mistakes.

He began with a mistake regarding the joint statement. He threw an unwarranted pebble into the water and created waves. One wave led to others. Next was the Ito resignation. Foreign affairs should essentially be handled by the prime minister. In any era, the main actor in foreign affairs is the prime minister himself, while the position of the foreign minister is like that of a parliamentary vice minister from another government ministry."

However, there is also sympathetic argument. A Dietman of the LDP in charge of foreign affairs remarked, "In retrospect, his ASEAN tour was a mistake. Mr. Suzuki went there and became overconfident. He also tried to strengthen his initiative in foreign affairs vis-a-vis the United States. But there are many aspects of foreign affairs

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which are difficult to influence through individual power alone. Usually, circumstances facing the nation at the time become the deciding factor. The prime minister's overconfidence produced the turmoil over the Japan-U.S. joint statement, but I think Mr. Suzuki regained himself just before his European tour.

In any case, things went too smoothly during the six months after his inauguration. He gained self-confidence in the ASEAN countries. But if he has returned to his former self of caution and harmony as the result of the recent crisis, it means he has passed his test at an early stage. The fact that he is now aware that individual power cannot in any large measure influence foreign affairs indicates that he has learned his lesson."

This is completely different from Matsuno's contention that foreign affairs should be managed by the prime minister, but Suzuki was unmistakably tossed about by foreign affairs during this time. He appeared to be affected by his troubles and returned to his former self during the European tour in June, where his lack of confidence was reportedly conspicuous, showing him a pitiful figure.

It would be worth watching which of the two attributes of "stupid" and "monarch" comes to the fore in the future. Will he continue as a cross between Sato and Miki, and show the strong side of a "monarch," or will he succumb to his failures by being "stupid?"

Will The Suzuki-Tanaka-Fukuda Alignment Last?

Among the so-called three elements of "fortune, dull-wit and spirit," probably 70 percent of the fate of an administration is decided by "fortune." Although one may mourn, "If only Fukuda had not been careless," or, "If only Ohira had not died so suddenly," it was probably to a large degree a matter of fate.

It would be meaningless to speculate whether Suzuki would be blessed in the future with good fortune, or whether he will be forsaken by fortune, but as far as the circumstances in which his administration was formed are concerned, they were unmistakably very fortunate. Even when those around him asked after Ohira's death, "Don't you think it's your turn?" Suzuki was evasive, saying, "I would like to be the one to appoint a prime minister. I would like to be the most influential party member, but I am not the prime minister type." In the end he reportedly said, "I am no longer able to avoid the appointment." Whether or not that was his real state of mind, the realization of "Prime Minister Suzuki," which had not been in the thoughts of anyone including himself, became a fact before anyone was aware of it. This can only be described as good fortune.

There are three keys to predicting the stability of the Suzuki administration as it enters its second year. First, the factional relations within the LDP, especially the transition in the balance between the three main factions -- the Suzuki, Tanaka and Fukuda factions -- which support the Suzuki regime.

Secondly, the manner in which the administrative reform will be carried out. And, third, the ties with such extra-party forces as the national consensus and the opposition parties. These three factors will decide the fate of the administration while deeply interacting with each other.

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First, the situation within the LDP which has lacked serenity. Koichi Kato (former chief Cabinet secretary), who managed the affairs of the younger Suzuki faction members, sees the present conditions as follows. "I am aware of active rumors that the Suzuki regime is stumbling because of the Ito resignation issue. My feeling is that the administration has sufficiently overcome both the Ito issue and the treatment of the Reischauer testimony. It has made an 80 percent or 90 percent recovery from the damage received from these issues. I think party conditions surrounding the Suzuki government have settled down beyond expectations. Commotion prevailed within the LDP for eight years under four party presidents, following the forming of the Tanaka government. And it reached a climax during the last year of the Ohira regime. In effect, Mr. Ohira bore all the agony within the party and died on his cross. Like Christ, he bore everything and died. After the storm subsided, peace and stability, and an absolute majority, remained. From the standpoint of party strife, a recess period had begun.

However, since the LDP is an energetic party, I feel sure that it has the ability to recover from the eight years of fatigue, within a year, and to again pit one's energy against another. But, in order to do so, it is necessary for the anti-Suzuki forces within the party to concentrate somewhere. At the moment, such a phenomenon is not clearly seen. Therefore, I think the present quietness will continue for some time."

It is quite a wishful outlook. But, as far as the ostensible impression is concerned, it is close to Kato's view. Despite incessant rumors of a shortlived government and a popular theory concerning party succession, there are no anti-Suzuki forces or prominent successor candidates in sight.

Nonetheless, a subtle undercurrent of movement is beginning to manifest itself. Although the Suzuki-Tanaka-Fukuda alignment, which supports Suzuki, is closely knit as the political correlation chart shows, how long will it continue? Toshikazu Fukuya (former Lower House member), a political pundit, analyzes the connection.

"The Suzuki Cabinet is already forsaken by those other than the direct Suzuki followers. On surface, he is supported by the three factions, but the Fukuda and Tanaka factions continue their support merely because they prefer to remain in the present lukewarm state of affairs. In other words, both Fukuda and Tanaka want to avoid a change in party presidents. They also feel they would like to keep an absolute majority. It is convenient to continue a 'calm and windless' state of affairs based on an absolute majority.

However, the important leadership is not forthcoming from the prime minister/party president. Therefore, in order to offset it, the bosses of the major party factions tighten the reins on their factions. Unless they do so, all hell will break loose ("A hundred poets will sing"). Also, Mr. Fukuda could continue as faction leader, and Suzuki will listen to him. Mr. Kishi's retirement and Mr. Miki's gradual loss of power over factional affairs indicate that Mr. Fukuda could retain control as the 'shadow prime minister.'

As for Kakuei Tanaka, I think he is of a similar frame of mind. Under present conditions, he could continue to rule over party affairs as leader of the largest faction, and he could move Suzuki around at will. In fact, he succeeded in tying Susumu Nakaido down in one of the three major party posts. Nonetheless, it is perhaps

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well that a balance exists between the Tanaka and Fukuda factions, but if a single cross-purpose should occur, the situation could explode instantly. In that sense, the Suzuki government is a castle built on sand."

However, only six months earlier, when the Tanaka faction was expanding rapidly and those inside and outside the party were watching Tanaka's moves and relations between the Suzuki, Tanaka and Fukuda factions, the same Fukuya said, "Suzuki is presently close to Mr. Fukuda. One might say, the two were stuck together. As in the case of everyone else, once a person is inaugurated as prime minister, he tries to become independent from Mr. Tanaka's influence. This is also true in Suzuki's case. He declares his reluctance to be under Mr. Tanaka's influence. As for Mr. Tanaka, he evidently feels he wants to restrain Suzuki, so he takes the offensive by setting up Nikaido. Of course, Mr. Tanaka did not necessarily abandon Suzuki. As for the views of the various party factions regarding the aggressive steps taken by the Tanaka faction, the Nakasone faction probably felt uneasy, while the Suzuki faction was afraid and the Fukuda faction was shocked."

Also six months ago, a young Dietman of the Suzuki faction said, "From the standpoint of relations between the forces supporting the Cabinet, Mr. Suzuki cannot stick close to Tanaka. That is the difference from relations between Tanaka and Ohira, because Mr. Tanaka was the only ally of Mr. Ohira. However, even Mr. Ohira depended on himself and did not adhere to Tanaka. He put a stop to Tanaka's heavy pressures. In Mr. Suzuki's case, Mr. Tanaka is not his only ally. He does not stick closely to him, which angers Mr. Tanaka. But Mr. Tanaka should know best the circumstances surrounding the birth of the Suzuki Cabinet. The public thinks that Mr. Tanaka created it, but a close scrutiny of the moves made at the time indicate that it was formed only after Mr. Fukuda, who had remained quiet, raised his hand to gesture that 'Suzuki is okay.'"

Through such testimonies, it is apparent that the Suzuki-Tanaka-Fukuda connection was rocking with tension six months ago. Today, there is a discrepancy between "peace and serenity" (Kato) and "a castle built on sand" (Fukuya), but a tentative balance does exist.

It was Suzuki's bold decision to approach Fukuda which brought a change six months ago. He looked to Fukuda for guidance as his mentor, and asked Fukuda to visit the United States to pave the way for his own Japan-U.S. summit meeting. The then Foreign Minister, who was disturbed by this, remarked, "It should be the task of the foreign minister. Moreover, what could his purpose be in using Mr. Fukuda, who was Mr. Ohira's political foe?" This became a factor later in Ito's resignation. A honeymoon relationship between Suzuki and Fukuda was glaringly evident, close enough to conjure up a shadow Fukuda Cabinet.

When he paid a courtesy visit (on 6 June) to Fukuda's private residence prior to his European tour, Suzuki chatted at length in the sitting room with the Fukuda couple, and Mrs. Fukuda said to him as he was leaving, "Hold your chin up, Suzuki-san."

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It was during the height of criticism against Suzuki on the Japan-U.S. issues. It was also rumored in political circles that he must have revealed his frustrations to the couple and received words of sympathy.

Suzuki's strategy in flattering Fukuda to the skies has worked. At first, Tanaka intended to restrain Suzuki, who refused to bend to his will, and tried to enlarge his own faction through force tactics. Whereupon Suzuki, instead of recoiling, dared to repel Tanaka and more openly sidled closer to Fukuda. If Tanaka were to push any farther, Suzuki and Fukuda would totally unite and create a fission in the Suzuki-Tanaka-Fukuda alignment. There was even the apprehension that Tanaka would become isolated.

That would spell trouble for Tanaka and, as Fukuya says, it was advisable for Tanaka to "continue the status quo."

Tanaka retreated, and the temporarily ominous atmosphere was cleared to permit a return to the comparatively stable Suzuki-Tanaka-Fukuda tri-factional alignment.

Although Fukuya talks of a castle built on sand, one should not overlook Suzuki's astute intraparty control tactics seen in this tug-of-war episode. Instead of trying to maintain a balance with both Tanaka and Fukuda, his tactic of pushing Tanaka back by drawing closer to Fukuda gives an insight into his tough nature. Rather than a "castle built on sand," one should see the alignment as an impregnable triangle, where the interests of Suzuki, Tanaka and Fukuda are balanced.

Fukuda's Post-Suzuki Goal

It is true that a new development has recently become apparent. A sort of collusion has appeared in the Tanaka-Fukuda relations, which was thought to have been maintained with Suzuki as the middleman. Especially noticeable is the change in Fukuda. On his lecture tour in the United States (late March), Fukuda stated, "The domestic scene in Japan today is unusually stable. Mr. Suzuki is a respected man, who is astute in political management. There is no possibility of his administration stumbling in the face of attacks by the opposition. The problem lies with the party in power. If something should happen and a pretext should be made to impugn Suzuki, there is no clearcut candidate who could fill the post-Suzuki slot. Japan's political situation will continue to be quiet and stable for some time."

He thus publicized the stability of the Suzuki administration and confirmed his chances for reelection. Also, on his return home on 8 April, Fukuda made a grandiose speech before 120 Dietmen at a meeting to report on his trip, which was held in a large hall in the LDP headquarters. He clarified his all-out support for Suzuki.

"We do not at all intend to imitate the Reagan administration but I think Mr. Suzuki's administrative reform is the greatest proposal since the Hamaguchi Cabinet's great coup. First of all, we must unify the party members and rally support by all means. We must carry out the reform in a crowning glory, but it would be a crowning glory for the reform and not for the Suzuki government."

However, two months or so later, Fukuda clearly changed his tune. Apparently becoming conscious of his chances for a post-Suzuki government, he is reportedly approaching Tanaka to form a Tanaka-Fukuda alliance which excludes Suzuki.

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Recently, when asked about the future of the Suzuki government, Fukuda replied as if he had forgotten about Suzuki's reelection question, "It would be unethical to say there is no one except Mr. Suzuki (as a suitable prime minister), so I won't say there isn't. Nonetheless, since we are confronted by many problems at home and abroad, I don't think a change of administration would be good. Let's take care of next year's problems next year. Things might change by then, you know. In any case, we expect Mr. Suzuki to exert his full energy toward the solution of the problems. If he succeeds, the stability of the Suzuki government will be enhanced." (YOMIURI SHIMBUN 24 June 81)

Fukuda thus switched from a posture of full support for Suzuki to that of a bystander. Also, when asked in the event of a fall of the Suzuki government whether he would be ready to form a Cabinet, if urged by the party members, Fukuda tentatively replied in the negative, "I don't want to join the mudfight. I have had enough of that. I am interested, but I won't stick my nose in." (YOMIURI SHIMBUN 24 June 81)

It was a superficial remark made in an interview. He reportedly told his close associates, "It won't be long for Suzuki now. Japan-U.S. relations have deteriorated, thanks to Suzuki. The political test does not rest on administrative reforms or personnel management, but on Japan-U.S. relations. There is no administration which caused relations with the United States to decline and lasted long. Suzuki cannot pass the test, unless he handles matters very astutely, but our guess is that it will be difficult. I may be urged to take over, but I cannot accept if it is only for a short period. If given three years, I may be induced to try mending Japan-U.S. relations." These words indicate his strong ambition.

With Fukuda inclined to run, there is no reason for Tanaka not to respond. Rumors were circulating in political circles that Tanaka said, "After Suzuki, there is no one but Fukuda or Nakaido." Whereupon Fukuda is said to have replied immediately with great flattery, "Mr. Tanaka is a gifted politician, who is one of a kind in thirty years." It is typical of the political world that, if necessary, a still more brazen lip service can actually take place.

There has been a history of fierce struggle between Tanaka and Fukuda, and Fukuda knows well that Tanaka will not easily lend a helping hand to his resurgence. But in the political world, once a struggle begins for power, a different atmosphere usually takes over. It is not unusual for yesterday's enemies to join hands.

In a hypothetical movement to support Fukuda for reelection, the posture of the Tanaka faction -- the largest LDP faction -- would be decisive. The reason is, whether it is an aggressive or passive support, the party direction would be greatly influenced simply by a clarification of non-opposition to the movement. There is a wide variation between support and nonsupport, and the subtle shades of difference between the factions would determine the direction the political struggle would take.

If Tanaka had really spoken of the alternatives of "Fukuda or Nakaido," it would indeed be big news for Fukuda. The reason is, since it is common knowledge that the materialization of "Prime Minister Nakaido" would be difficult for the moment, and if that was truly Tanaka's intention, an early Suzuki retirement would hasten Fukuda's chances. It is only natural for the Suzuki-Fukuda relationship to become unhinged.

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Of course, the Tanaka side has other plans. It is probably like a Tanaka faction cadre has stated, "In effect, Mr. Tanaka's aim is ultimately to restore himself to power. Toward such a goal, which administration is best as a successor? Should he fight against Fukuda, or should he join hands with him? Mr. Tanaka's considerations all start out from such a base."

It is probably Tanaka's intention to drive a wedge between Suzuki and Fukuda, and to take the initiative in the Suzuki-Tanaka-Fukuda alignment. That fact that Fukuda has begun to aspire to the post-Suzuki premiership has given Tanaka an opportunity to move towards his goal.

Fukuda, and of course Suzuki too, can continue to play the psychological Suzuki-Tanaka-Fukuda alignment game while reading Tanaka's strategy. The surfacing of the post-Suzuki movement has sparked increased activity in the three-way game. Yet it cannot be considered to be necessarily disadvantageous to Suzuki.

As Kato has stated, the time is still distant before the party factions would engage in infighting and the anti-Suzuki forces would unite to launch a full-fledged "topple Suzuki movement." Meanwhile, Suzuki is more adept than Fukuda in manipulating the party members in the psychological game, and it would be interesting to see what moves Suzuki will make in his second term, after the Suzuki-Fukuda honeymoon in his first term has ended.

According to Michiharu Nakamura, he met Suzuki before the latter's trip to the United States, and he said, "You seem to be getting along with Mr. Fukuda. Is it for real?" Whereupon Suzuki answered, "I believe he is quite sincere. That's the reason why I am being sincere. That's all."

This exchange is interesting, because it is typical of Suzuki. It contains the nuance that, if Fukuda's sincerity is suspect, Suzuki's attitude could also change. It reminds one of Suzuki's pragmatism. One could say, the fact that he does not try to apply the unreliable yardstick of whether or not the relationship is real gives one an inkling of Suzuki's basic strategy in organizational control.

How will the Suzuki-Tanaka-Fukuda coalition change in the future, and will it lead to the disintegration of the Suzuki regime? Or, will it become further stabilized? The answers are inseparable from the second and third keys.

Debate on Administrative Reform: Is It Feasible Or Not?

Whether he succeeds or not, the Suzuki administration will be remembered forever for its hand in administrative reform. If the proposed plan is successful, he may make a glorious exit, just like Sato after the return of Okinawa. On the other hand, despite his successful revision of the U.S.-Japan mutual security pact, Kishi reluctantly relinquished his government under duress.

Tanaka used his successful restoration of Japan-Sino relations to move ahead. Suzuki is conceivably the same type as Tanaka. If he moves on the right track, his administration will gain strength, but he must be prepared to resign if he fails.

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The second key is administrative reform. First, let me quote Koichi Kato's words. "Regarding Suzuki's statement that he will 'stake his political life,' people say it is premature to make such a statement, or that he probably let his tongue slip without realizing its grave significance. Seriously, however, the Suzuki Cabinet had only two alternatives: To increase taxes or to economize. This year, there were several large targets, such as corporate taxes and automobile taxes. But next year, there will be none. The only alternative left is to economize. Considering only the budget issue, even if Mr. Suzuki were not the prime minister, administrative reform would have unavoidable. I believe the Suzuki administration is capable of accomplishing it."

Suzuki himself has repeatedly stated, "Isn't it true that, of the two alternatives, administrative reform is the only route?" However, there are many ways, slow or quick, to carry it out.

There is some danger, as Kakuei Tanaka has pointed out, "If it was during the Ohira regime, he might not have said anything like 'staking my political life on administrative reform.' I think Ohira would have considered administrative reform too formidable a task and settled for non-recognition of any increase in budget expenditures. If the Suzuki Cabinet is capable of implementing administrative reform in three years, Ohira might have taken six years. Ex-bureaucrats are not likely to do anything drastic with the bureaucratic system. In that sense, some party politicians do resort to policy measures which are somewhat extreme." (Interview in ASAHI SHIMBUN, 19 June)

Tanaka's theory on the reform of the Japanese Islands was also a party politician's brainchild. The administrative reform plan is probably an attempt which is similar to Miki's reform of the political funds control act and the anti-trust act. They are all attempts to maintain the status quo.

Criticism of the administrative reform plan, which is tied to vested interests, is steadily rising within the LDP. Toshikazu Fukuya says, "I don't believe the administrative reform contemplated by Suzuki is feasible. The LDP is a political party whose farm politics and subsidies have garnered votes. A serious implementation of administrative reform would shake the very foundations which prop up the LDP. There is no reason why Suzuki should do that. After all, he has made quite a big show. He was ecstatic with an absolute majority as his support. Although he stresses a 'politics of harmony,' I believe in reality it is the exact opposite. I don't believe the administrative reform plan will make any headway."

The debate leans toward an "impossible" view, rather than discussing the merits and shortcomings of administrative reform itself.

At the present stage, it is difficult to predict how it will evolve, so let us put aside any discussion of its feasibility. However, when the main debate on administrative reform begins in July, the confrontation between the "pros" and "cons" will take on added heat and breadth.

Whether Suzuki will be able to provide leadership in coordinating the debate may become the test which will decide the fate of his administration. First, there is the coordination necessary to draw the line somewhere, and also the question of how Suzuki will respond when coordination fails and the majority decides the reform is not feasible.

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Kato says, "Prime Minister Suzuki's method of emphasizing the party consensus on the one hand, and watching public opinion on the other has a low center of gravity, so there are few factors to cause a storm to erupt." Nonetheless, a confrontation between party opinions and public opinion over administrative reform must be seen as inevitable. The third key is, whether Suzuki will join hands with public opinion on the "pro" side.

Consistent Importance Attached to Public Opinion

In looking back on Suzuki's politics during the past year, it has been surprisingly consistent in its attachment of importance on public opinion. His "politics of harmony" has evolved in a multifacet manner, and it appears to have been given a high priority in his political judgments.

His response to Tanaka's Lockheed affair; the storm over constitutional revision; the American demand for the bolstering of Japan's defense strength; the three non-nuclear principles; and administrative reform -- when forced to make hard choices, Suzuki has acted generally in line with public opinion trends. Of course, he may have taken other factors into consideration also, but Suzuki's realism has apparently persuaded him of the safety in staying close to lines of common sense demanded by public opinion.

Mrs. Suzuki, who accompanied him on his European tour, spoke in New York of "my husband, Zenko," revealing his political posture aptly. "He never loses his composure. He is always like the same, ordinary water temperature. It never turns boiling hot nor icy cold. Depending on the occasion, the water expanse is broadened or narrowed; or the speed of the water flow is altered. It flows according to the terrain and never tries to flow against it. He is like a river which never tries to cut into the banks, or to cause floods to the people's predicament, but flows serenely on.

I think his philosophy is that there are probably many arguments concerning the defense issue, and that it is not advisable to confuse people with sudden changes; that one cannot win over a national consensus by doing so. However, if that is the national consensus, he will go along with the flow and maneuver freely. He is not an obstinate person."

Mrs. Suzuki also spoke about the importance of the national consensus -- that is, public opinion. In some aspects, the public opinion connection has made it difficult for the opposition parties to attack him.

It reminds me of the time both the Upper and Lower Houses conducted a joint investigation into the Reischauer testimony. Such Diet polemicists as Masashi Ishibashi (former secretary general) and Takahiro Yokomichi (executive secretary of the special committee on anti-base measures) of the Japan Socialist Party concluded after a discussion of ways to attack Suzuki, "We shouldn't hurt him too much. If we destroy him, a more hawkish prime minister from the farther right might show up."

Junya Yano, secretary general of the Komeito Party, also said, "This could be the most dovish administration to come out of the LDP."

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If Suzuki should be pushed to the wall by being repelled by the LDP factions, it is not inconceivable that the opposition parties would rally around to support him. As the political correlation chart shows, the opposition forces stand close to the Suzuki administration, and not in confrontation. Especially the four centrist parties -- the Komeito, Democratic Socialist Party, New Liberal Club and the United Social Democratic Party -- are close enough to ride on the same bus. The pro-Suzuki public opinion surrounds him at the outer fringe. Therefore, Suzuki's political position is not necessarily unstable.

According to recent opinion polls conducted by the newspapers, the ASAHI SHIMBUN shows 36 percent in support and 39 percent in non-support. The YOMIURI SHIMBUN shows 37 percent in support and 42 percent in non-support. The non-support figures thus surpassed the support figures for the first time. However, the MAINICHI SHIMBUN showed a slightly larger number in support, with 33 percent in support and 31 percent in non-support. Considering that the polls were taken during the height of the Japan-U.S. controversies and the nuclear issues, the support figure should not be deemed as being low. It could turn upward in the event of a controversy over administrative reform. The problem lies within the LDP, where frequent storms are brewing against the outside. However, Matsuno says, "Everyone in the party is watching to see whether Suzuki will succeed in winning national support. The reason is, it may affect themselves some day. If they can win in the next election with Suzuki as their leader, they will support him. If they feel they will lose, they will instantly demand a change in leaders. They are all alert to this. In that sense, the Suzuki administration could be said to be standing at the crest of a precipice. It is said, a politician in charge of a government is powerful, but if he loses the people's support he will roll down the hill like a snowball."

If Matsuno has accurately described the atmosphere within the LDP, Suzuki, who seeks a union with public opinion, might be surprisingly longlived.

The "Suzuki style," which became a household word a year ago, has finally begun to bare its contour. Even if he is destined to resign prematurely, his manner of retirement will be interesting to watch.

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POLITICAL AND SOCIOLOGICAL

POLITICAL UNION VIEWED BY COLUMNIST

Tokyo MAINICHI DAILY NEWS in English 17 Sep 81 p 2

["Nagatacho Doings" column by Takehiko Takahashi: "Unified Communion of 'Ex-LDP' and 'Ex-JSP'"]

[Text]

In the world of politics, instead of action being taken based on a theory, there are often cases in which action is taken first and a theory formed later based on that action.

The New Liberal Club and United Socialist Democratic Party are no exceptions to this. In the case of the New Liberal Club, it was at a time when the Liberal-Democratic Party was following the path of a decline that the NLC was formed, centering on Yohei Kono, in a manner tantamount to forsaking the LDP.

What would be the best way to participate in the administration? This must have been the thought uppermost in the minds of the NLC leaders at that time. If the LDP were to lose its majority to a greater extent because of the birth of the NLC, the LDP would be forced to ask for NLC's cooperation in forming a coalition government. The NLC would then be able to participate in the government under more favorable conditions than as one faction of the LDP.

Contrary to this calculation by the NLC, however, the Liberal-Democratic Party today possesses a stable majority in both the House of Representatives and the House of Councillors.

Under such a situation, there is no opportunity for the New Liberal Club to appear on the stage. The only thing it can do is to wait for the next general election with the hope that the LDP's strength will decline. In preparing for that day, the NLC's own influence must be strengthened.

This situation also applies to the Komeito and the Democratic Socialist Party. That is why DSP's Chairman Ryosaku Sasaki is calling repeatedly for a "coalescence of middle-of-the-road influences."

At one time the DSP hinted at readiness to join a coalition government if a call were issued by the LDP.

Komeito Stance

The Komeito is outwardly taking an anti-LDP stance, but inwardly if the LDP were to call upon it to join a coalition government, the Komeito too would like to accept. Together with the LDP, there are several places, including the Tokyo metropolitan assembly and local assemblies, where the Komeito is the government party and it is well aware of how advantageous it is to be the government party.

DSP Chairman Sasaki has four parties—Komeito, DSP, NLC and USDP—in mind for

the "coalescence of middle-of-the-road influences." Before this plan could make headway, another plan by the NLC and USDP to form a unified intra-Diet communion has moved ahead.

In the House of Representatives, the NLC has 11 seats and the USDP only 3. When combined they total only 14. They rank the lowest numerically among the opposition parties. Forming a unified intra-Diet communion would not be of much advantage to the NLC. Nevertheless, the aim might be to apply a brake on the "coalescence of middle-of-the-road parties" advocated by DSP Chairman Sasaki.

If the New Liberal Club were to coalesce with the Komeito and DSP, opposition would arise within the ranks of the NLC. It might even lead some of the members to withdraw from the NLC and join the LDP. And yet, if the NLC remains befuddled, the movement for "coalescence of middle-of-the-road influences" will gain momentum and the NLC might become isolated among the opposition parties.

Therefore, it conceived the idea of forming a unified intra-Diet communion with the USDP, even if that party has only three members, in order to forestall the "coalescence of

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middle-of-the-road influences."

The United Socialist Democratic Party is an influence that seceded from the Japan Socialist Party. In its policies or constitution, it stands midway between the DSP and JSP. Since the NLC is inherently a conservative party, it is strange, from the theoretical standpoint, for it to leap over the DSP, whose policies are close to those of the LDP, and to clasp hands with the USDP.

Nevertheless, rather than theory, an attempt is being made to act first and then affix a theory afterward. This theory would be: "The New Liberal Club has a more liberal position than the doves of the Liberal-Democratic Party. The NLC is critical of the LDP. The Komeito and Democratic

Socialist Party have recently become no different than the LDP in their approach to a neighbor country and the course of strengthening military capability. If the New Liberal Club were to join the Komeito and DSP, it would be dragged by the two parties' policies and the spirit of the NLC's founding would be lost."

Since the United Socialist Democratic Party has no voice in the Diet with only three members, it would like to combine with the NLC and become able to take part in discussions.

For the "ex-LDP" and "ex-JSP" influences to join hands might well represent an age of "dropout from ideology." In the case of a political party, the reality seems to be that ideology is only incidental.

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POLITICAL AND SOCIOLOGICAL

LIBERAL-DEMOCRATIC PARTY LAUNCHES MEMBERSHIP DRIVE

Tokyo MAINICHI DAILY NEWS in English 23 Sep 81 p 2

["Nagatacho Doings" column by Takehiko Takahashi: "LDP Members Dwindle to One-Tenth"]

[Text]

The thoughts that people have are accompanied by both "plus" and "minus" factors. What was once considered "a good idea" to solve a problem may later turn out to be "a dud."

A good example is the revision of the Liberal-Democratic Party's system for election of the party president. Not so long ago the LDP decided to have the party president elected with the participation of all party members. This was evaluated highly as being unprecedented in conservative politics.

In the first election held under this system, there were four candidates—Takeo Fukuda, Masayoshi Ohira, Yasuhiro Nakasone and Toshio Komoto. A preliminary vote was to be held to determine the two leading candidates for the party presidency. The Diet members attached to the LDP would then cast their votes to select one of the two as the party president.

The result of the preliminary voting placed Ohira in first place and Fukuda second. Fukuda thereupon declined to be a candidate in the main election. Accordingly Ohira became the party president and assumed the reins of office.

This was a surprising result for the people. Moreover, the real situation of registered party members was am-

biguous. It is said that 1,510,000 party members participated in the preliminary voting but the question arose as to how many of them actually paid the dues themselves. Doubt was also raised as to whether or not some of the names were fictitious.

After much introspection on this election, a revision of the system was studied. Not knowing what kind of system would be newly adopted, those intending to become candidates for party president made frantic efforts to gather party members who would support them. As the result, the party membership swelled to 3 million. It was said that 1 million of them supported Komoto.

Without Election

After the sudden death of Ohira, however, the Suzuki administration was newly established. Zenko Suzuki became the party president without an election. A revision of the system for choosing the party president was carried out, centering on Hajime Tamura, chairman of the LDP's National Organization Committee.

It was decided that voting would take place in the preliminary election on three candidates for the party president. Moreover, each

candidate would require the recommendation of 50 Diet members belonging to the LDP. If the number of candidates was less than three, a preliminary vote by all party members would not take place. The party dues were also raised to 3,000 yen annually.

Under this system, and when the actual situation of the LDP is considered, there is practically no possibility of a preliminary vote being held. Under such circumstances, there would be little meaning to paying 3,000 yen in dues. On the other hand, if a would-be candidate were to defray the dues for his followers, it would amount to a very big sum and would be a waste if the preliminary vote were not held.

Because of such a situation, the LDP membership fell conspicuously. Although there were 3 million members at one time, it has dwindled to one-tenth or 300,000 at present.

The party members have also decreased in the Gumma Prefecture and Hyogo Prefecture constituencies of Director General Nakasone of the Administrative Management Agency and Director General Komoto of the Economic Planning Agency, who are looked upon as influential candidates to succeed party president Suzuki. The only places where the LDP

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membership has not fallen off seem to be Saitama and Shizuoka prefectures.

Party finances have suffered a severe blow from this falling off of membership. Annual dues of 3,000 yen multiplied by one million members would amount to 3 billion yen. Two-thirds of this, 2 billion yen, are returned to local branches of the LDP. A decrease of 1 billion yen in income is a bitter pill for the LDP headquarters to swallow, but the local branches are the ones who will suffer more.

'Organized Party'

Among the local branches, there were some which once declared, "the Liberal-Democratic Party has finally become an organized political party. Let's build a hall in

commemoration." Construction of halls was started in some places. But the party members have dwindled, feeling that "there is little meaning in being a party member if we can't participate in the election of the party president."

When Tamura formulated his revision plan, it was regarded as a brilliant idea. But today the vitality of the LDP has fallen and trouble is being encountered financially. The "minus" aspects of the revision plan are drawing attention.

The Liberal-Democratic Party is endeavoring to gather party members by designating October as "a month for promoting the acquisition of party members." It is doubtful whether great expectations can be placed on this movement.

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POLITICAL AND SOCIOLOGICAL

FORMATION OF NEW POLITICAL GROUP WELCOMED

Tokyo MAINICHI DAILY NEWS in English 25 Sep 81 p 2

[Editorial: "New Political Group"]

[Text]

An amalgamation of two small political parties is merely a slight change in the political world but we hope that it will become a harbinger of new waves in Japanese politics.

The New Liberal Club and the United Social Democratic Party have formed a new group called the "Shinjiyu Club-Minshu Rengo" (literally, New Liberal Club-Democratic Alliance) in the House of Representatives. The group comprises 13 members and remains the smallest party in the Lower House. We cannot expect a new political phase by its activities in the Diet. The question, however, is whether or not the energy to form the new group would prompt full-fledged political movements which may come next.

In a statement issued at the inaugural ceremony, the group said it aims at doing away with the rule established by the Liberal-Democratic Party, which had won an overwhelming victory in the June elections of the House of Representatives and House of Councillors in 1980, and also at concentrating political forces which can replace the present LDP government.

Originally, the goal was specified by the four middle-of-the-roaders, including the Komeito and Democratic Socialist parties. In the process of concentration, the two smaller parties were left out. The four parties could not unite themselves because of the difference of views on diplomatic and defense policies between the Komeito and the DSP.

An amalgamation of political parties is a difficult thing and cannot be implemented in a simple way. For example, one of the 11 NLC members refused to

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join the new group, saying: "The new group represents a merger with a political party which has a different political ideology from mine, and this is against my political philosophy and against the will of the voters who voted for me."

We support the merger because the new group's political target to put an end to the LDP rule is in accordance with the general voters' wishes. We also believe that the Japanese political setup centered on the Liberal-Democratic and the Japan Socialist parties for more than 25 years has brought about inflexibility and corruption.

In this sense, the birth of the new group is not the completion but the start of a new political trend. We want to emphasize that the merger will end up as "news in brief" in political circles if the new group fails to prompt a wide-scale amalgamation of the middle-of-the-roaders as a whole and form a new political group to replace the LDP government.

One thing we want to reemphasize here is that such an amalgamation must be put into practice based on solid principles and not in a hasty manner. In the joint statement, the group said that it will try to check an easygoing trend to expand military strength and a right-leaning tendency. It also confirmed that the group will faithfully follow the three non-nuclear principles.

We hope that the new group will faithfully follow the nonarms expansion and non-nuclear principles. At the same time, we call for the Komeito and the DSP to become aware of the fact that their recent statements, which can be interpreted as their support for expanded military strength of Japan, run counter to the public expectation in the concentration of the moderate groups.

What has attracted our attention was the merger between the NLC, which has been regarded as the follower of new conservatism, and the United Social Democrats who have a nostalgic feeling for socialism. Their step indicates that they are pioneers who can put an end to ideological confrontation. They have made a choice that they will pursue an urban-style political party formula with dovish diplomatic and defense policies.

Out of the 13 members, Seiichi Tagawa, Yohei

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Kono and Toshio Yamaguchi were Liberal-Democrats before the formation of the NLC some five years ago and Hideo Den, Yanosuke Narasaki and Shogo Abe were Socialists four years ago. All of them were dissenters and their formation of a new group may forecast political changes.

The new group is not a new party. But group members will join hands in their parliamentary activities. We hope that their activities will send a fresh breeze into the Japanese political world.

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POLITICAL AND SOCIOLOGICAL

SONODA-GROMYKO MEETING ANALYZED

Tokyo THE DAILY YOMIURI in English 25 Sep 81 p 2

[Editorial: "Dialog With Moscow"]

[Text]

Foreign Minister Sonoda's meeting with US Secretary of State Alexander Haig and Soviet Foreign Minister Andrei Gromyko during the current UN General Assembly session have opened the way for dialogs among the three nations.

At the Sonoda-Gromyko meeting, Japan and the Soviet Union agreed to resume their administrative-level consultations which have been suspended since 1979. They also agreed to reopen regular foreign ministerial talks.

These developments are welcome. However, Gromyko again dashed Japanese hopes for the return of the Soviet-occupied northern islands off Hokkaido when he said there was no territorial issue between the two countries. He accused Japan of making such territorial claims under prodding from China and the US, saying that Japan was taking steps to become a military power.

Gromyko's charges follow the line of Soviet President Leonid Brezhnev who told the 26th general meeting of the Soviet Communist Party in February that Japan's diplomatic policy was marked by its sympathy for the dangerous plans of Washington and Peking and its leaning toward becoming a military power.

Need For Perseverance

Realistically, the Japan-Soviet territorial issue is related to changes in the international situation. Japan must persevere to solve the issue while helping to promote dialog between the US and the Soviet Union and to ease world tension.

In the 1956 Japan-Soviet joint statement, Moscow promised to return Habomai and Shikotan islands to Japan after they conclude a peace treaty. Later, however, the USSR condemned the signing of the Japan-

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US security treaty and said it would not return the islands unless the US forces withdraw from Japan.

In the 1973 Japan-Soviet joint statement, issued by then prime minister Kakuei Tanaka and Brezhnev, the two countries agreed to solve various issues pending since World War II and to conclude a peace treaty. This friendly interlude was broken after a defecting Soviet pilot landed his MiG in Japan in 1976 and Japan and China concluded a peace treaty in 1978.

Japan's claims to the northern territories have nothing to do with either the US or China. The Soviet Union has been changing its stand by relating the territorial issue to the international situation. Moscow appears to be haunted by the phantom of collusion among Japan, China and the US, which does not exist.

Back To Basics

When the administrative-level consultations are resumed, the two countries should return to the line of the Tanaka-Brezhnev joint statement. It is quite natural that talks should be held on the basis of an agreement once reached by the leaders of the two countries.

"The unsolved issues pending since World War II," as mentioned in the joint statement, are nothing more than the territorial issue. There are no other unsettled issues between the two countries.

We hope that talks on the territorial issue will materialize as a result of an easing of tensions through a US-Soviet dialog and the promotion of disarmament.

Still, we cannot condone the Soviet invasion of Afghanistan, which is counter to the principles of peace. Japan cannot easily lift its sanctions against the Soviet Union. The Sonoda-Gromyko meeting laid only a thin thread which can lead to further talks. We must try to enlarge this opening to attain our purpose.

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ECONOMIC

PRIVATE CAPITAL OUTLAYS REPORTED RUNNING HIGH IN FY 81

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 pp 1,2

[Text]

Domestic investment in plant and equipment by Japanese corporations looks likely to continue at a high level and lead, together with exports, the economy's recovery in the rest of fiscal 1981 and beyond, according to the result of a survey of investment programs of major corporations by the Nihon Keizai Shimbun published last week. (An interim tabulation of the survey was reported in the Japan Economic Journal September 1 issue.)

Planned capital investment for fiscal 1981 of the 1,290 firms totaled ¥11,688.9 billion, up 11.1 per cent over fiscal 1980's actual spendings. In fiscal 1980, they grew by 20 per cent. Compared with these corporations' original investment programs for the fiscal year, surveyed as of last February, the latest figure represents an upward revision of 1.6 per cent.

The major source of strength of capital spendings is the manufacturing industries, including, particularly, steel and electric machinery. Even such sluggish areas as chemicals are moving to step up capital investment, the survey noted. Smaller enterprises with a capitalization of ¥0.5-5 billion are also willing to invest vigorously.

The corporations' mounting interest in new plant and equipment stems from necessity to deal with recent rapid technical

innovations and soaring costs of energy and to survive severe competitions both at home and abroad. Labor saving and new product development are the top priorities in the investment programs. Since investment geared to such purposes is outside the influence of business cycles, the surge in private plant and equipment expenditures that started in the latter part of fiscal 1978 is considered likely to keep its momentum for some time to come.

Capital investment planned by manufacturing concerns for fiscal 1981 is up 12.7 per cent from fiscal 1980, according to the survey, while that of non-manufacturing firms is up 9.7 per cent. The sharp rise in manufacturing investment reflects more than 20 per cent increases in such areas as steel, electric machinery, transportation equipment excluding autos, and precision machinery. Among non-manufacturing sectors, electric power firms plan spendings 9.9 per cent larger than last fiscal year, while airlines and fisheries are slowing investment.

With regard to original investment programs for fiscal 1981 surveyed as of last February 1, 603 firms, or 46.7 per cent of all, have revised upward the planned spendings, and 266, or 20.6 per cent, have revised downward.

The margin of upward revi-

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sion is 4.9 per cent for the manufacturing industry. The most bullish are electric appliance makers which are being compelled to boost production capacity to keep up with rapidly expanding demand for video tape recorders (VTRs) and office automation equipment. The volume of investment planned by electric appliance makers for fiscal 1981 has come ahead of that of the steel industry, following electric power and automobile industries.

A noteworthy trend is a sizable upward revision reported by the depressed chemical industry. The higher investment program stems from the intensifying race for capacity build-up for fine chemicals and linear low density polyethylene. "If we fall behind in investment under the pretext of business slump, we will lose out to foreign competitions, which could mean demise of the Japanese petrochemical industry," says

Masaki Yoshida, president of Mitsubishi Petrochemical Co., referring to the acute sense of crisis gripping the industry.

Substantial upward revisions

Plant & Equipment Investments Planned for Fiscal 1981

	No. of firms surveyed	Plant & equipment investments (¥ billion)
Construction basis		
All industries	1,290	11,688 (+11.1)
(Excl. power firms)		8,031 (+11.7)
Manufacturing	839	5,575 (+12.7)
Non-manufacturing ...	451	6,113 (+ 9.7)
(Excl. power firms)		2,456 (+ 9.5)
Payment basis		
All industries	1,287	12,054 (+13.2)
(Excl. power firms)		8,394 (+15.0)
Manufacturing	833	5,745 (+18.3)
Non-manufacturing ...	454	6,308 (+ 8.9)
(Excl. power firms)		2,649 (+ 8.5)

Note: Percentage change from fiscal 1980's actual spendings in parentheses.

in investment programs were also reported by the steel industry striving for an ever larger proportion of products with higher value added, such as seamless pipes and elec-

trolytic galvanized products. Machinery makers are also stepping up investment to meet strong demand for robots and other electronically operated equipment.

As for reasons for revising upward investment programs, nearly half — 46.1 per cent of all — cited labor saving, in which targets are continually upgraded and enhanced as a result of progress in utilization of electronics for production equipment and systems. Next comes development of new products.

One significant trend in fiscal 1981 investment programs is a sharp rise in outlays for research and development, which is up 37.9 per cent from last fiscal year.

(The survey is based on increases in tangible fixed assets over the preceding year.)

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ECONOMIC

FUJITSU FANUC LAUDED AS MOST CORPORATELY SOUND

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 3

[Text]

The most outstanding company in Japan as to overall corporate excellence in fiscal 1981 is Fujitsu Fanuc Ltd., numerical control device maker, with the second and third highest ranking going to Mori Seiki Co., a NC machine tool maker, and Toyota Motor Co.

This is according to the Nihon Keizai Shimbun's latest check-up of overall corporate standings based on fiscal 1980 financial data with its NEEDS-CASMA system — Nikkei Economic Electronic Databank System-Corporate Appraisal System Multi-variate Statistical Analysis.

It showed that the first two places were won by corporations which were opening new demand in the mechanical-electronics (mechatronics) field, in a broad sense, in answer to the new times requiring economization of labor and energy.

The assessment also ranked in the top grouping such large Japanese enterprises capable of competing with the world's best as Toyota Motor, Matsushita Electric Industrial Co., Hitachi, Ltd., and Nippon Steel Corp.

Japan's economy has been registering a stable growth after weathering two oil crises, and the soundness of its economic fundamentals thus

has draw the world's attention.

However, Japanese corporations face more trouble in the future, such as necessity to surmount the rollback of the Western world, such as exemplified in the U.S. Reagan Administration's industrial revitalization policy, and to cope with increasing international trade frictions.

The Nihon Keizai Shimbun strove to obtain an image of what exactly was an excellent corporation in fiscal 1981 in the overall sense by combining its NEEDS system with the appraisals made by its reporters and those of Nikkei Business, its magazine.

The checkup was directed at 1,487 companies chiefly listed on the nation's eight stock exchanges, with the top 1,000 then being selected for appraisal. Of them, the top 50 are as shown in the table.

The survey results showed that the excellent companies comprised largely those taking the lead in electronics and mechatronics, such as electric equipment, machinery, automobiles and precision machinery, and pharmaceutical firms.

Fujitsu Fanuc, the best, was found to rate 957 points, or nearly double the 500-point average mark. This company's production system is automated to such a degree as to

arouse comment that its robots produce robots. Its market share of numerical control devices reaches 75 per cent.

Second-place Mori Seiki also boasts a domestic market share of over 20 per cent in the field of producing NC type lathes. Its export ratio reaches over 60 per cent since it exports oil drilling equipment to the U.S. and also machine tools to aircraft makers throughout the world.

While its enterprise scale is far from being large, Mori's earning power is of an extraordinary nature since it turns out high value-added products based on high technology.

The fourth best company was found to be Kyoto Ceramic Co., which has achieved swift corporate growth on the strength of its integrated circuit ceramic packages. It commands the biggest share of the world's market in this area.

TDK Electronics Co., top maker of magnetic tapes, was ranked fifth. This company has a 35 per cent share of the world market for video tape recorder tapes, and 20 per cent for audio tapes. It undertakes production in the U.S.

Hitachi Maxwell Ltd., Pioneer Electronic Corp. and Victor Company of Japan also came in within the 20th ranking. These companies are alike in that they have originality in develop-

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50-Top-Ranking Firms by NEEDS-CASMA Rating

	Points		
1 Fujitsu Fanuc.....	957	27 Hitachi	746
2 Mori Seiki	888	28 Matsushita Communication	745
3 Toyota Motor	880	Industrial	745
4 Kyoto Ceramic	876	28 Hankyu Department Stores.....	745
5 TDK Electronics	860	30 Seven-Eleven Japan	737
6 Hitachi Maxell	840	30 Seino Unyu	737
7 Taisho Pharmaceutical	825	32 Makita Electric Works	733
8 Chofu Seisakusho	823	33 Matsushita Electric Trading	732
9 Pioneer	821	34 Toyoda Machine Works	731
10 Nippondenso	799	34 Olympus Optical	731
10 Matsushita Electric Industrial.....	799	34 Casio Computer	731
12 Nissan Motor	788	37 Marudai Food	730
13 Fujisawa Pharmaceutical	778	38 Wacoal	729
14 Mochida Pharmaceutical	770	38 Shiseido	729
15 Kokusai Denshin Denwa	768	40 Ricoh	727
16 Victor Co. of Japan	766	41 Honda Motor	725
17 Canon	764	42 Toyoda Automatic Loom Works	724
18 Matsushita Electric Works	761	43 Shionogi	723
18 Nifco	761	44 Fuji Photo Film	721
20 Security Patrols	757	44 Nippon Television Network	721
21 Eisai	755	46 Dai Nippon Printing	717
22 Matsushita Seiko	753	46 Sharp	717
22 Tokyo Style	753	48 Best Denki	714
24 Sony	751	49 Mitsukoshi	713
25 Bridgestone Tire	749	50 Takeda Chemical Industries	712
26 Green Cross	747	50 Matsushita Reiki	712

ing new fields of business with their strong technological development capacity.

Seven pharmaceutical companies, including Taisho Pharmaceutical Co., Fujisawa Pharmaceutical Co. and Green Cross Corp., also "made" the top 50 ranking. Their earnings run high on the basis of their technological development capacity.

It is also a fact that the ranks of the big businesses which represent Japan have gone up this time. Toyota Motor, which was fifth last year, rose to third. Matsushita EI climbed from 15th spot to 10th. Nissan Motor

Co. edged up to 12th. Hitachi rose from 65th to 27th, and Nippon Steel, from 201th to 67th.

Those that rate high in the listing were companies which were producing "strategic type" products and whose product share also was high on the world market. It was shown that financial status of most of these top-rate and international companies were supported by high earnings.

They were enjoying a "favorable cycle" of high earnings — development of high value-added products, this increasing market share, and again garnering high earnings.

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SCIENCE AND TECHNOLOGY

GOVERNMENT, ACADEMIA, INDUSTRY TO DEVELOP MICROPROCESSOR

Tokyo NIKKAN KOGYO SHIMBUN in Japanese 5 Aug 81 p 1

[Text] A basic agreement has been reached between Matsushita Electric Industry, Sanyo Electric, Sharp, Mitsubishi Electric, and Osaka University for joint development of a "new microprocessor" with a new logic structure. This plan is being carried out as part of the Kinki district's information industry development project. The Osaka Trade Bureau and the Osaka Science and Technology Center (Masahiro Wada, chairman) have decided to give it active support. Since it is the first large-scale project in the Kinki district with the joint participation of government, industry, and academia, there are great hopes for its success. The new microprocessor, which is the leading item to be developed, is planned to be a "non-Neumann type" computer which can perform high-level parallel processing. It will be the "Kansai version" of the fifth-generation computer development plan being promoted by MITI. However, this project is primarily aimed at developing popular applications. The specific plans will be firmed up this year, and the official start of the project, following determination of the operating budget and development period, is scheduled for next year.

Intended Mainly for Popular Use; To Begin Next Year

This project came out of the activities of the Kinki Information Industry Development Committee, which was organized as an advisory committee to the Osaka Trade Bureau director last spring. A statement by the committee this spring emphasized the need for a joint research organization centered around industry but enlisting the support of government and academia. There are no mainframe computer manufacturers in the Kinki district, but there is a concentration of high-level technology for microprocessors, and the area leads in technology for popular use (one-chip microcomputers, etc.). Microcomputer-related industries are also active, and the committee arrived at a consensus that the total capacity of the Kinki microelectronics industry should be brought together for information industry development.

They decided to build a joint research organization around a nucleus of private industry, the three major Kinki electronics companies--Matsushita, Sanyo, and Sharp--and Mitsubishi, which has its central research laboratory and its base for semiconductor development in the Kinki district, and obtain the participation of the local university, Osaka University. It is possible that there will be further participants, including other influential companies whose business is related to microcomputers, plus Kyoto University.

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The new microprocessor which will be developed will be a next-generation computer popularly referred to as a "non-Neumann" computer. It will be used to solve the problems of the present control system, the sequential processing method (software crises such as program complexity, expanding program development and maintenance costs, low speed, etc.). By using a high-level parallel processing system which can carry out a large number of commands simultaneously, it becomes possible to eliminate troublesome programming, carry out commands closer to the operator, and process normal language.

A major technological factor behind the development of this "non-Neumann computer" is the shift from LSI circuits to VLSI circuits. The technology for developing the device, keeping in mind the aim of popular use, will be based on an extension of silicon technology. Development of a new microcomputer (VLSI) will require an especially large investment, so mass consumption will be essential to increase the effectiveness of the investment. A practical application for popular use is suitable because it involves mass production and lower cost. Also, the Kinki district has a traditional strength in the popular applications of electronics, and there is a firm foundation of applied development capacity. This is one reason for carrying out this project. In this respect, the concepts used will differ from those used in projects for fifth-generation mainframe computers. Beginning next year, an operating budget will be determined, and a research association consisting mainly of four private companies will be organized and given the go-ahead.

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SCIENCE AND TECHNOLOGY

MARKET FOR NEW INFORMATION, COMMUNICATION SYSTEMS GROWS

Tokyo NIHON KEIZAI SHIMBUN in Japanese 31 Aug 81 p 1

[Text] The market for information and communications systems, collectively known as the new media, has begun to expand a great deal, and industry is rapidly building up its forces for the new media market. Some of the new media, which will enter the stage of practical application from 1983 on, include expanded television functions to follow audio multiplex broadcasting such as character multiplex broadcasting, conversational broadcasting devices that permit response from the viewer or listener, and the CAPTAIN system (Character And Pattern Telephone Access Information system), which searches out image information using telephone lines and television sets. Electrical equipment manufacturers and related industries are responding by assembling a business organization to combine the efforts of research and development and sales departments. At the same time, securities companies, banks, and advertising companies have begun to examine sales strategies for the period of dissemination of the new media and are thinking about business possibilities related to the new media.

The "new media" is emerging because: 1) As the "information society" advances, individual preferences and lifestyles are diversifying and the recipients of information are not satisfied with one-way information. There is a tendency toward more selection of information. 2) Because of the amazing progress of communications and electronics technology, the equipment required for the new media is inexpensive and widely available. Also, the progress of the new media is not confined to equipment manufacturers. It has spawned new business in information-providing industries and in advertising and publicity.

Under these conditions, the most conspicuous movement in the manufacturing industry is the innovation in equipment by manufacturers of electrical and other equipment in response to the appearance of the new media. Toshiba Corporation has recently organized project teams by type of media for the development of video discs, "a record that makes pictures," and a parabola antenna for home use that will receive electrical waves directly from satellites, in addition to voice multiplex and character multiplex broadcasting.

Nippon Electric has newly established a C and C (computer and communications) public system promotion group which will focus on the new media. Matsushita Electric Industrial and Mitsubishi Electric have both set up organizations to handle the new media in their research laboratories and main offices. This series of

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movements indicates that these manufacturers consider the new media to be a strategic field with very practical possibilities.

Particular plans include the following: 1) The CAPTAIN system is scheduled for practical application in 1983, 2 years from now, and character multiplex broadcasting is expected to be ready by 1983. 2) Expansion of communications, broadcast satellites, and the use of light communication is expected as we move toward 1995. These developments show that there is an awareness that the new media is close to a period of rapid expansion. This has motivated industry to work with the new media.

The VTR (video tape recorder) has been called the "advance guard" of the new media. This year it will grow into an industry that goes beyond color television. Kenzo Tatematsu, director of the Matsushita Electrical Equipment Image Information System Development Promotion Center, has said that the beginning of audio multiplex broadcasting "has promoted a demand for color television that is beyond expectations." Products related to the new media have become major products for equipment manufacturers.

A "television that anticipates 1983," which looks ahead to the period of practical application of the new media, has come on the market. One such item, a "television with multiple built-in functions," was recently put on the market by Japan Victor. In addition to audio multiplex broadcast reception and VTR recording and replay features, it has a videodisc player and a hookup for the CAPTAIN system. Sony has begun selling a "single function" television, with only a picture tube separate from the speaker and tuner.

The new media whirlwind is headed for the overseas market. For example, Sony is locally manufacturing a receiving terminal for the Prestel system, the British version of the CAPTAIN system. The home converter and program production equipment for CATV (cable television) in the United States is said to be mostly made in Japan.

New participation by fields other than the related equipment manufacturers has become conspicuous in the form of provision of information. Nomura Securities, the largest securities company, is providing an information service to its customers with VTR and facsimile. With the end of next year as the target, it plans to install a uniform display system (television image display devices) throughout its network of domestic and foreign branches and to develop an international investment information system. Financial institutions have also begun to study the use of the CAPTAIN system to improve and streamline their teller services.

The advertising industry has taken notice of the role of the new media as an advertising medium and has quickly begun to study its influence on "existing media," such as television and newspapers. Dentsu, the leading advertising company, is participating in experimental projects for the CAPTAIN system and has set up a special video disc organization. Hakuhodo, the second largest company, has established a "media research and development center." These efforts by industry to apply the new media to new business seem likely to become more and more active in the future.

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SCIENCE AND TECHNOLOGY

JAPANESE AUTO INDUSTRY VIEWS RISING PROBLEMS

Tokyo DIAMOND'S INDUSTRIA in English Vol 11, No 9, Sep 81 pp 8-12

[Text]

Japan's exports of automobiles (four-wheel vehicles) during fiscal 1980 (April 1, 1980~March 31, 1981) totaled 6,152,108 units, according to the Japan Automobile Manufacturers' Association. The figure represented a record 25% increase over the previous year. Export business in two-wheel vehicles was also brisk in that year.

Despite all these, the auto industry community seemingly lacks vividness. This is probably because the United States and the European Community are stepping up restrictions on imports of Japanese cars, while domestic sales of new cars show a more or less downward trend.

However, nobody in the auto industry, which has become the top earner in the nation's external trade through energetic efforts and research activities, must have lost his aggressive attitude to move ahead constantly by resolving whatever difficulties standing in the way. In this article we will present the current state of the auto industry from the standpoint of economics (possibly including political aspects) and technology. (Ed.)

Exports to U.S. Market

During fiscal 1980, which ended on March 31, 1981, 2,576,381 cars were shipped to North America. That represented about 40.7% of Japan's total automobile exports - 6,152,108 units (four wheel vehicles). A majority of them were bound for the United States. It is a really big market for the Japanese auto industry, and major fluctuations in demand there could deal a serious blow to the industry. Therefore, the scale of exports to the U.S. is the

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most important factor for Japanese automakers to project their annual business plans.

However, growth of car exports to the U.S. has rapidly slowed down during the past few years because of protectionist moves on the part of the United States. Discussions continued within the Japanese auto industry and the Japanese Government to decide whether the industry should exercise voluntary export control or the two countries should conclude a governmental agreement to fix annual shipment volumes. Initially, the Government assumed the position that the auto industry should control exports on its own and that the Government would provide administrative guidance only when it was deemed necessary. However, U.S. pressure for self-restraint increased after the turn of the year, while there was persistent demand for Japanese cars among U.S. consumers. As a result, the Government decided to seek a political settlement. Through the talks between the Japanese Minister of International Trade and Industry, Rokusuke Tanaka, and the U.S. special trade representative, William Brock, on May 1, 1981, Japan agreed to curb car exports to the U.S. during fiscal 1981 to the 1,680,000 unit level. They also agreed to control the volume of exports for fiscal 1982 and 1983 to an extent to be decided after studying market conditions.

Thus the problem of car exports became a political issue between Japan and the United States. The Ministry of International Trade and Industry originally calculated to fix the ceiling above 1,700,000 units, but eventually accepted the agreed figure, as Prime Minister Zenko Suzuki instructed a quick settlement in the fear that it could develop into a political issue that would affect diplomatic relations between Tokyo and Washington.

Immediately after the agreement, International Trade and Industry Minister Tanaka issued a statement saying that the Japanese Government fully recognized that the U.S. Government was making serious efforts to reconstruct the U.S. auto industry and that the latest agreement was a provisional measure which was taken on the assumption that the U.S. would continue such efforts, with a view to expanding the Japanese economy under the free trade system. Prime Minister Suzuki, too, emphasized that the measure was taken to maintain the free trade system throughout and that the measure would not be applied to the European Community or Canada without conditions.

However, Takashi Ishihara, president of Nissan Motor Co., Ltd. and concurrently president of the Japan Automobile Manufacturers' Association, expressed strong dissatisfaction over the latest decision. He said it was extreme-

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ly regretful that the industry's position, that the voluntary control measure should be made a provisional one limiting the export volume to below last year's level and lasting for only one year, was not accepted. Probably there were strong hopes within the industry that the ceiling for exports would be set at a level far more than the actually fixed volume — 65% of the exports last year and that the control would last for only a year. At the same time, the Japanese auto industry fears that the European Community will demand similar measures and that the agreed three years of voluntary control will also force great sacrifices on manufacturers which supply materials and parts to assembly makers.

Repercussions and Countermeasures

Whether the industry likes it or not, the export ceiling for fiscal 1981 has been set at 1,680,000 units, which is the mean volume of actual exports to the U.S. in fiscal 1979 and 1980 — 1,546,740 units (up 9% over 1978) and 1,819,092 units (up 17.6% over 1979). The Ministry of International Trade and Industry set the export quota for each automaker on the basis of the average of its exports during the past two years with a marginal adjustment of increase or reduction. Toyota Motor was given a quota of 518,000 units (-6,200 units from the average), Nissan Motor 458,600 unit (-5,600), Honda Motor 353,000 units (-4,800), Toyo Kogyo 159,000 units (-2,300), Mitsubishi Motors 114,000 units (+3,100), Fuji Heavy Industries 66,000 units (+2,200) and Isuzu Motors 17,000 units (+13,600). Thus the quotas were unfavorable for the top three makers. This was designed to help close the widening gap between big and small makers in exports to the U.S. At the same time, considerations were given to makers affiliated with U.S. automakers (Mitsubishi with Chrysler and Isuzu with GM).

In sales of passenger cars, Japanese automakers are heavily depending on exports to the U.S. market, and a fall in the field of business could give a fatal blow to smaller makers. It is, therefore, reported that approaches to MITI by automakers for bigger quotas were quite aggressive. In deciding the quotas, confrontation between the Big Two (Toyota and Nissan) and other manufacturers was also brought into relief. Toyota and Nissan called for quotas based exactly on the past results. Other makers demanded adjustments, asserting that flooding exports by big makers caused the latest trade friction. Some maker

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even said that it would withdraw from the Japan Automobile Manufacturers' Association to pursue its own way in export business. Thus there was confrontation among the members of the association. Under the circumstances, MITI officials continued heated discussions for days with export staffers of automakers.

However, all makers complained about the quotas they had received. Even smaller makers who had additional quotas were not satisfied. Some of these makers said that the quotas would not be enough to maintain the operations of their dealers in the U.S. Although the ceiling of exports for fiscal 1981 was generally acceptable for both Japanese and U.S. Governments, it caused great dissatisfaction and left a heavy residue of hard feeling among Japanese car manufacturers.

These manufacturers are now busy working out counter-measures to continue business expansion in spite of the bleak situation in trade with the U.S. Many are studying plans to develop new export markets in countries other than the U.S. The number of automobiles registered in Japan totals about 37 million units to the total population of some 110 million. The domestic car market is obviously in a near-saturation. On the other hand, Japan's automobile production now stands at about 10 million units a year. The auto industry needs to export more than half of them if it tries to maintain the production scale of last year. And, they possibly want to keep this year's output at the previous year's level. However, European countries are stepping up controls on car imports from Japan. Makers have turned their eyes to Latin American countries. In fact, car shipments to Latin America sharply increased in 1980, and it is becoming the third largest export market for Japanese cars, following the United States and Europe. But business in that part of the world is not at all easy, because inflation is rampant in some countries and the political situations are not very stable in some countries.

Therefore, some makers are placing more emphasis on exports of trucks and other vehicles than passenger cars, while promoting car exports in "knock-down formula." Exports of used cars to Southeast Asian countries are likely to increase further. One of the big makers here began a large-scale market survey and sales campaigns for used cars in Southeast Asia. But all market watchers questioned point out that used car business in Southeast Asia is not very profitable, because market prices are sluggish, while users ask for more improved performances.

In trade with the U.S., many manufacturers hold a view that they should add more values to their products to take more profits out of the limited number of exports. Toyota, for example, will probably try to expand the export of

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more expensive passenger cars like "Celica" and "Cressida." But some observers say that exports of expensive passenger cars are not very promising since these products will inevitably compete with "J-Cars" of GM. Another effort to earn more profits would be to sell more optional equipment, such as power steering, air conditioners and car stereo sets. Makers especially want to sell more air conditioners. In exported cars, 90% of high-grade cars are equipped with air conditioners. But the ratios of medium- and low-grade cars are 20%-30%. These ratios may be raised more in the future. Options like power steering, car stereo sets and aluminum wheels are all expensive products. More cars to be exported to the U.S. may be equipped with these optional goods.

Anyway, Japanese automakers will face various difficulties in trade with the U.S. The fact that the ceiling of exports was set this time through governmental talks will probably be used as a sort of precedent to impose sanctions on Japanese automakers whenever the U.S. auto industry complains of "excessive exports."

Parts Exports

Despite their self-restraint on car exports to the United States and European Community nations, Japanese automakers have so far no plans for major production cutbacks. Some makers even maintain that there will be no change in the production scale this year, while some company executives say they can hardly foresee demand two or three months ahead. Changes in demand, up or down, will inevitably affect business of parts makers.

Recently, however, it has been often reported that Japanese auto parts makers had concluded contracts to directly supply parts to assembly makers overseas. These reports appear to suggest the future of Japanese auto parts manufacturers.

For example, Nippon Oil Seal Industry Co., Ltd. built a production plant near Atlanta, Georgia, U.S.A., last year, and it went into operation in November with a total of some 300 employees. (Of these, 50 are Japanese engineers for provisional assignment.) The company's products are ranked "A" by General Motors Corp., following rigid tests last year. A wide range of oil seal products for cars will be supplied to GM in large quantities, starting this autumn. Nippon Oil Seal is Japan's top oil seal product maker with a domestic market share of about 60%, and seals and related products for automobiles account for more than 50% of its total output.

Products of Nippon Oil Seal will probably be installed on J-Cars, a rival product of Japanese compact passenger

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cars. In this connection, an executive of the company says, "Competition in the auto parts is harsh. On the other hand, if the quality of products is high, any automaker will buy them. Japanese cars may use American-made parts, while American cars use Japanese or European-made parts. We are exerting efforts to make better products under the concept that we are not just for domestic automakers but for all automakers in the world."

To be sure, the quality of Japanese-made auto parts are fairly high by the world standards. The above-mentioned executive attributes this to Japanese automakers and car users who are particular about quality problems. Undeniably, the high product quality has helped raise the popularity of Japanese cars in the world market as it is today. The Japan Auto Parts Industries Association says that exports last year totaled \$3,752 million, a 23.8% increase over the previous year (including those used in cars exported). This comes to about ¥849,700 million, according to the average exchange rate of last year. The figure represents about three times the amount of exports five years ago. This year's exports might reach ¥100,000 million, since the value of the yen tends to decline and also exports during the first half of this year were above the level of the previous corresponding period.

Especially notable in this year's exports is that shipments of replacement parts for cars exported in the past are likely to increase. Also likely to increase this year are parts for knock-down exports of cars to foreign automakers by Japanese assembly makers. Overseas production plants of Japanese parts makers will expand production to supply more parts to automakers in the countries of their locations, as in the case of Nippon Oil Seal Industry.

Competition is undeniably fierce among parts makers. But future prospects of Japanese auto parts makers are rather bright, because the qualities of their products are high. The Japanese automotive parts industry should therefore, continue efforts to make even better products to become a major parts supplier for automobile manufacturers in the world.

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SCIENCE AND TECHNOLOGY

AUTOMOTIVE ELECTRONICS ERA FORETOLD

Tokyo DIAMOND'S INDUSTRIA in English Vol 11, No 9, Sep 81 pp 14-17

[Text]

Microcomputer Cars

When Nissan Motor Co. carried out model changes on Datsun 280C (Nissan Cedric/Gloria on the Japanese market) in June, 1979, it marketed models equipped with an integrated microcomputer-controlled engine system for the first time in Japan. This system is called an "Electronic Concentrated Engine Control System" and dubbed as "ECCS." This system constantly detects engine conditions, the position of the accelerator pedal, the transmission shift position, the car speed, the air conditioner operation and the battery voltage, and it decides the fuel mixture, the ignition timing and other factors for the best engine performance.

The Japanese auto industry was late in the adoption of a microcomputer system for engine control compared with its American and European counterparts. But Nissan's ECCS is the most comprehensive system, which controls even the state of the combustion chamber. And the marketing of cars with this system was called by mass media the beginning of the "era of microcomputer cars."

In October, 1980, Toyota Motor Co. similarly announced the marketing of Cressida (Mark II in Japan) equipped with a TCCS (Toyota Computer Control System) engine. TCCS

employs a 12-bit microcomputer, compared with the 8-bit type of Nissan, and Toyota claims that its system covers more areas of control. Honda Motor announced that the company is ready to adopt a 16-bit microcomputer for the engine control system. TCCS is now also employed by Crowns. Nissan's ECCS is also available for Datsun 280ZX (Datsun Fairlady Z in Japan). However, the costs of these systems are still high, and they are still options for high-grade models.

Microcomputer systems were originally developed to more properly meet the world's strictest control standards for exhaust fumes now in force in Japan. In August, 1971, Nissan marketed Datsun Bluebird U (now Datsun 810 Maxima in North America) equipped with an EGI (Electronic Gasoline Injection) engine. Toyota's first system of the kind is an EFI (Electronic Fuel Injection) system, announced in September, 1971. The conventional mechanically controlled carburetor was unable to maintain the ratio of fuel and air mixture at high degree of accuracy required for the best performance of the 3-way catalyzer to reduce the contents of HC, CO and NO_x from exhaust fumes. The microcomputer-applied fuel injection system served the purpose of accurately controlling

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the fuel and air mixture in varied conditions. EGI and EFI are of devices of that system.

EGI and EFI outdid the carburetor in engine starting, response, torque and fuel economy, and are now applied for many models. Following Nissan and Toyota, Mitsubishi Motors, in May, 1980, marketed Galant (Dodge Challenger, Plymouth Sapporo in North America) equipped with an ECI (Electronic Control Injection) engine, and in September, 1980, Toyo Kogyo marketed Luce (Mazda 929 overseas) with EFI. In the meantime, Nissan and Toyota were developing more integrated system — TCCS and ECCS — to eventually open a real era of microcomputer cars.

In the meantime when EGI and EFI were commercialized, Toshiba developed an "electronic engine control system" in a joint project with Ford Motor Co. of the United States and was making the product for Ford. TCCS was jointly developed by Toshiba, Toyota and Nippondenso of the Toyota Group. In June, 1973, Nissan established a joint venture with Diesel Kiki and Robert Bosch of West Germany to establish Japan Electronic Control Systems to manufacture EGI devices. In July, 1981, it was reported that General Motors had asked Toshiba for joint development of an electronic engine control system. These developments indicate that Japan is at the world's top level in this field of technology.

Automotive Electronics

The development of transistors popularized car radios and car stereo sets. Electronic technology is now employed not only in controlling the engine but in various other areas. One example is an electronic skid control.

When strong pressure is applied on the brake pedal on a slippery road, the rear wheels would be locked and the car would skid and lose directional stability. To prevent this, the electronic skid control system electronically adjusts the hydraulic pressure of the brake system.

Another example is the auto speed control system which maintains the car speed at a set rate without setting on the accelerator pedal. Expensive air conditioners control the room temperature with an electronic system which senses the outside temperature, engine conditions and other factors. Electronic techniques are also applied to the windshield wipers and door locks.

Toyota installed a "Speak Monitor" by using synthetic voice on Cressidas marketed in October, 1980, for the first time in the world. In the device, the sound waves of voice are stored in the computer memory through an analog-digital conversion, and they are reproduced by a program control system. The synthetic voice gives warnings when the system monitors any one of the six most popular acts of negligence: when the ignition key is left in; the seat belt is not on; the lights are on even after the engine key is turned off; the fuel is low; the door is not properly closed; and the parking brake is on. Nissan installed a similar system on Laurel last year, and it is now available for an option for four types of Nissan cars and is becoming gradually popular.

Car instruments are also becoming electronic. Toyota adopted an electronic display meter system to Soarers marketed in February, 1981, for the first time in Japan. In this system, a fluorescent tube, a digital display by light emission diode or a light zone

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display is used for the speedometer, tachometer, fuel gauge, temperature gauge, speed warning and other gauges. Nissan employed a similar system for Silvia/Gazelle (Datsun 200SX in North America and Datsun Silvia in Europe), which were marketed in May, 1981.

There are quite a number of types of automotive electronic systems or car electronics having varied characteristics. While electronics systems control operations quite precisely, they are apt to cause troubles. Cars run on rough mountain paths. They go to an extremely cold place and hot place. Under such abnormal driving conditions, the temperature in the engine room rises remarkably, and car electronics was materialized when ICs and microcomputers, which can bear such severe conditions, have been developed.

In case of cars, there are many kinds of engines and car types which have their own properties and characteristics. Research and development in car electronics can not possibly be carried out by electronic appliance makers alone. Cooperation between car makers, parts makers and electronic appliance makers is indispensable. This recognition spread throughout the industry, while needs for tighter emission control and higher fuel economy increased in recent years. Against this backdrop, car electronics has made remarkable progress as it is today.

Selection and Totalization

Car electronics is receiving both praise and criticism. Many agree that the application of electronics has contributed to not only making car driving easier and safer but also reducing the car weight. On the other hand, some people say that the adoption of

the electronic display meter system, for instance, is a mere sales strategy aimed at consumers' fashion-pursuing trend. They say that no one needs "Speak Monitor" to put his seat belt on.

Since the microcomputer-applied engine control system is still expensive, some makers are trying to improve the performance of a carburetor without using a microcomputer. A typical product in this direction is "Racer 1S," an engine newly installed on Toyota's Celica models. Application of electronics in car products and systems will continue to expand in the future. Yet it will be selective throughout.

Since the microcomputer is expensive, there is an idea of economizing its use. The microcomputer control system for engines controlling some functions totally has already been established, as seen in ECCS and TCCS. But many of the systems for car electronics other than the engine's system are still under development, and there is no integrated system that would control the entire car functions in a comprehensive manner. In fact, manufacturers are still in a stage trying to develop an electronic system to control the performance of the engine and transmission combined.

Efforts are also being made to use car electronics to resolve driving and traffic control problems. Nissan produced an experimental "Radar Car" which can measure the distance between the car and the obstacle by radar and give a warning. A similar experiment is also being made by using a television camera. Another example is "Navicom" — an option for Toyota's Celicas. Once the location of the destination is set by the direction and the distance from the starting

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point, the Navicom will constantly detect the current location in relation to the destination and tells the distance still to go and a directional error if any. Therefore, it can guide the driver to an unfamiliar destination.

In April, 1973, the Agency of Industrial Science and Technology of the Ministry of International Trade and Industry launched a six-year national research project for "The Comprehensive Automobile Traffic Control System." The project was designed to develop a system to provide necessary information concerning changing road and traffic conditions for cars on the road and give them proper guidance by a telecommunication link between cars and the traffic control facilities at major intersections.

The project was participated in by five public organizations or research institutes, including the National Research Institute of Police Science of the National Police Agency, and nine private companies, including Toyota Motor and leading general electric and electronic manufacturers. Experiments were carried out by using an area of about 300,000 km² in the western part of Tokyo, includ-

ing the congested Shibuya and Roppongi districts.

The experiments were successful. The newly developed system is not yet in practical use because of its enormous costs. For a similar purpose, a driver inductive information system, "ALI," was tested in the Ruhr area of West Germany, and Robert Bosch and Volkswagenwerk took part in the research project. These experiments hint that car electronics will eventually cover traffic control problems.

The car electronics era has just begun, but aggressive research activities are now under way in quite extensive areas, repeating trials and errors, although some of the successful projects are already in practical use. Is an age really worth to be called a "car electronics era" coming in the near future? Japan now stands at the world's top in car production and is proud of its efficient production system and high production technology as well as of the high qualities of its products. Japan has another area of industry where it is prevailing. That is electronic technology. On this very thing does the car industry depend for its future progress.

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SCIENCE AND TECHNOLOGY

USE OF ROBOTS IN CAR MAKING DESCRIBED

Tokyo DIAMOND'S INDUSTRIA in English Vol 11, No 9, Sep 81 pp 18-20

[Text]

Industrial Robots

In the past, the most popular photograph of a car production plant was of a conveyor line where cars are near completion. In Japan, however, it has recently changed to the scene of the welding line of a car body. Many hands would come out of robots and perform the spot-welding of the car body. Of course, there is no man seen around the machine. It may give an impression that Japanese cars are being made by industrial robots.

In the introduction of robots for body welding jobs, Nissan Motor Co. was the most active. In fact, General Motors introduced robots for welding jobs earlier (in 1965) than Nissan (in 1967). Nissan first began using the Unimate robots of the U.S. at its Oppama Plant. Nissan is now using a total of about 500 industrial robots at its plants mainly for spot welding jobs. This is the largest number of robots being used among automakers of the world. Toyota Motor, too, must be using many industrial robots, although their number is not made public. Toyo Kogyo, Japan's third largest automaker, is now using about 150 robots. And it has plans to introduce 140 more units to a new plant now under construction and another 50 units to other plants. In other words, the

company will soon have 340 robots in operation at its plants.

The output of industrial robots in Japan has increased sharply in recent years. According to the Japan Industrial Robot Association, their shipments totaled ¥13,734 million in value in 1976, ¥21,128 million in 1977, ¥26,613 million in 1978, ¥38,080 million in 1979 and ¥76,928 million in 1980. An overwhelming number of those robots were shipped to the automobile and electric appliance industries. The ratios of the auto industry to total shipments from 1976 to 1980 were 30%, 34%, 39%, 38% and 30%, respectively. Similar ratios of the electric appliance industry were 21%, 23%, 24%, 18% and 36%. The association's survey indicates that the auto industry has been increasingly introducing industrial robots.

According to a survey published by the Robot Institute of America in March, 1979, there were 47,000 units of robot in operation in Japan, 5,850 units in West Germany and 3,255 units in the United States. Other countries surveyed had less than 1,000 units. As for high-grade robots having play-back or more sophisticated functions, Japan operates 3,000 units, the U.S. 2,155 units, Sweden 570 units and West Germany 450 units. As far as the survey shows, Japan leads the

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world in the use of industrial robots. The robots used for spot-welding at car plants have playback functions.

Japan with scarce natural resources heavily depends on imports for raw material supplies and therefore exports a large amount of manufactured goods made from imported materials to keep its economy running. Japanese industry, therefore, is making strenuous efforts to raise its productivity with a view to maintaining the competitive strength of its products on the overseas market. The active introduction of industrial robots is part of those efforts.

There is another reason why robots are prevailing in Japan. The introduction of robots, which can replace human hands, is liable to meet opposition of labor unions. In many countries, craft unions are popular and it is difficult to change occupations. In contrast, most Japanese labor unions are organized on a company basis, and a change in occupation is relatively easy. This would provide more opportunities to employ industrial robots.

The Japanese auto industry has made exhaustive efforts for business rationalization. Ideas of workers have been actively employed to improve the qualities of products and raise productivity. In June, 1981, Toyota Motor celebrated the 30th anniversary of the establishment of a system collect ideas for work improvement from among employees. During the period, a total of 5 million ideas, large or small, were received. During fiscal 1980 alone, 92.3% of the total number of employees presented an aggregate 859,000 proposals, and 94% of them are said to have been adopted. Not only the management but also all its

employees appear to be cooperating in business rationalization. This has created a favorable situation to employ many robots at auto production plants.

Merits of Robots

For spot-welding of auto bodies, automakers were using several multi-welders of Machine-Back of the U.S. in the past. These machines were able to weld many spots simultaneously. But their unit price was quite high and they were good only for one given model. They had to be renewed each time models were changed. As a result, the number of multi-welders was reduced to one, and others were replaced by industrial robots to perform spot-welding jobs. Such multi-purpose robots could be used regardless of model changes.

In October, 1977, Nissan Motor began using multi-armed robots, which were developed jointly with Toshiba Corp. This robot can take a maximum of ten welding arms. It solved difficult problem to place many industrial robots on the narrow space along the welding line. This, of course, is of a multi-purpose type. Then Nissan Motor developed the capping-back system, which used a sort of jig to perform minimized number of spot-weldings at the start of the body welding process. This robot thus replaced multi-welders.

In 1978, Nissan Motor carried out at its Zama Plant an experiment to run two different types of bodies simultaneously on a welding line. The mixed flow production system becomes important, when the number of body types increases and the output of each type falls. This would reduce

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additional costs required in the conventional one-line, one-type system. This experiment coincided with a report that Nissan was planning to build an assembly plant in the United States. This produced speculation that the mixed flow system was for the projected U.S. plant.

However, the adoption of industrial robots was not such an easy job. Many troubles occurred. The robots used were designed for more moderate operations. Gears to operate welding arms often broke. As a result, the robot maker and the automaker jointly produced more efficient and durable robots.

Automakers, in general, made various efforts to introduce industrial robots. For example, they raised the accuracy of press stamping to cut steel sheets for body sections. When welding was being done by human hands, errors in size and shape were tolerable to some extent. But a high degree of accuracy is required in case the job is done by robot. This, in turn, has resulted in raising the accuracy of finish and performance of products. This is another merit obtained by the adoption of industrial robots, in addition to the rationalization of the production line.

Step by Step

At auto production plants, robots were first begun to be used for transfer works to and from machine tools long before they were employed in the welding process. In the case of Nissan, robots were first employed for material handling at its Yoshiwara Plant where the company began assembling Datsun passenger cars for the first time after the end of World War II. The newly-completed Oppama

Plant took over car assembly operations in 1962, and the Yoshiwara Plant began specializing in the production of transmissions and steering gears, when the nation's economy was continuing rapid expansion. The plant was compelled to increase production and suffered a shortage of manpower, when it introduced material-handling robots to automate machine work. About 1,600 robots undertook jobs that would be done by men.

These robots were designed and manufactured at the plant, since such products were not available on the market at that time. Manufacturing them at the company's own plant was the best way to secure exactly what it needed and it was also economical. The use of these robots was expanded, as labor costs were sharply rising in the course of rapid economic growth.

Robots, which were initially employed to make up for manpower shortage, gradually turned into a big bearer of plant rationalization efforts. Robots also began to be used for welding and other dangerous jobs in unfavorable working conditions. Furthermore, robots have begun to play a more important role than work rationalization in the era of moderate economic growth.

Automakers are now trying to use robots for painting. In fact, a large portion of paint shop works has already been automated to minimize the danger of workers being exposed to the poisonous gas produced by paint solvent. But the finishing process, which involves elaborate work, is still being done by men. Tests on painting robots have been under way during the past several years, and they have finally come to

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stand practical use. In spot-welding, what is required of the robot is primarily to pinpoint spots for welding. In painting, the robot needs to control lines or areas involved in work. That is why the introduction of robots to the painting process has been delayed.

Kobe Steel, Ltd. has been turning out a robot for painting, "Kobelco-Trallfa" under license from Trallfa Nils Underhaug of Norway. It has already shipped out about 200 units, of which 80 units are delivered to automakers. They include robots for painting cylinder heads and cylinder blocks. In 1980 the firm announced the completion of a robot for body painting. Robots of this type have already been delivered to Nissan Motor, Fuji Heavy Industries and Honda Motor, two each. In June this year, it also received an order for additional two from Nissan.

Tokiko Ltd., a maker of automotive parts, is manufacturing painting robots with flexible wrists. It also developed a more sophisticated product and in July, 1981, it received an order for 20 units of those robots from Toyo Kogyo.

Kawasaki Heavy Industries, a big maker of spot-welding robots, has also

developed painting robots. Also entering this field are Mitsubishi Heavy Industries, Hitachi, Ltd. and Nachi-Fujikoshi. Big automakers are now introducing painting robots, following spot-welding robots. Parts makers also began using robots for arc-welding. They, in fact, are already using robots for various other types of work. The auto industry is likely to continue expanding the use of industrial robots for some time to come in order to facilitate the streamlining of production lines.

The Japanese auto industry has made production cutbacks, as the economy is shifting to an era of moderate growth and car exports are under voluntary control. However, the industry continues a high level of plant and equipment investments to raise product qualities and rationalize production lines with a view to preparing itself for the imminent start of a worldwide race in compact-sized cars. The adoption of robots is along this line. In addition to robots, Japanese automakers have employed electronic technology in many other areas. The adoption of electronics is rapidly advancing in both production lines and products.

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SCIENCE AND TECHNOLOGY

TECHNOLOGICAL INTERCHANGES AMONG BUSINESSES SPREAD

Tokyo DIAMOND'S INDUSTRIA in English Vol 11, No 9, Sep 81 pp 40-43

[Text]

This year is called the "first year of technological interchanges among businesses of different categories." This is because the technological interchanges among small- and medium-scale enterprises in the different fields have become noticeable and the Government has begun supporting the move.

This is against the background of the new age of technological innovation which came to the fore in the latter half of last year. The enterprises' strategy for survival, which has just been started, has many promises, but, at the same time, it embraces many problems that must be solved.

Background

The "Technological Interchange Plaza" was started in July, 1981, under the auspices of the Small and Medium Enterprises Agency of the Ministry of International Trade and Industry. It is designed to select, at the initiative of prefectures, about 30 managers of small- and medium-scale enterprises enthusiastic about technological development and hold their meeting on technological interchanges once a month. It is planned to hold such meetings in 25 prefectures, including Osaka, during the current fiscal year and spread them throughout the country during the next fiscal year.

The project is being backed up by the Small Business National Corp., an

organization affiliated with the Ministry of International Trade and Industry. The corporation already set up a specialized "Technological Interchange Department" and held the first national meeting on the technological interchanges among businesses of different categories in last March.

The technological interchanges among businesses of different categories are nothing new. Osaka Scientific Technology Center, which is a foundation, took the initiative in organizing such meetings in 1970. Local governments and private organizations embarked on similar projects around 1975 and the Small Business National Corp. began to tackle it in 1977 as a "project on the promotion of the transfer of technologies." But this year is called the "first year of the techno-

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logical interchanges among businesses of different categories" because the fever on technological interchanges has gained momentum among small- and medium-scale enterprises.

In the background is the coming of the new age of technological innovation which became conspicuous in the latter half of last year. The technological innovation, represented by "mechatronics" and bio-technology, began earlier than expected.

Such a fever was brought about because small- and medium-scale enterprises have a sense of crisis that they would not be able to survive without the interchange of technologies.

Idea Registration System

In Tokyo, there is the "Small and Medium Scale Enterprises Development Center," a group for technological interchanges among companies of different categories. Established mainly by small- and medium-scale electronic and electric appliance and machinery makers in southern Tokyo at the end of 1979, it has a membership of 40 companies. For a membership fee of ¥20,000 a month, they hold a meeting to exchange information after a monthly directors' meeting, visit enterprises and promote interchanges among the members through study meetings on future technology and four other themes. The meetings also provide the members with an opportunity to promote interchanges among themselves.

Yoshiaki Kaneko, senior managing director of the center and also president of Sanki Electronics Industry, says: "Since the presidents of small- and medium-scale enterprises are craftsmen, their brains are treasure houses of ideas. New products can be developed by merely making public

their technologies, know-how and hints which otherwise would be wasted."

Hikari Alloy and Nippon Shiki Industry have jointly devised equipment to prevent by remote control the freezing of tap water faucets in cold districts and they have been given a subsidy from the New Technology Development Foundation. Kanie Gear, Sanki Electronics Industry and R.T.C. (software development company) also developed jointly an automated gear tooth check device. The group of Leo Technological Institute, Print Electronics Research Institute and Shukosha (maker of automated drafting machines and bookbinding machines) has devised equipment for automated designing of print bases. It is said that the equipment can be produced at one-fifth of the cost, compared with existing machines. The scope of technological interchanges is expanding as seen in the joint use of office computers and the opening of microcomputer study courses.

What is interesting is the "Idea Registration System," which began in December last year. Under the system, ideas expressed at meetings to exchange information are recorded to prevent the infringement on patents. Toshihiko Hori, chief of the Small and Medium Scale Enterprises Development Center, points out that a new mechanism of management is important for new organizations and that new ideas will be necessary for the establishment of joint booking of orders and sales. As Tsutomu Kiri-hara, deputy chief of the Technological Interchange Department of the Small Business National Corp. put it, the technological interchanges among small- and medium-scale enterprises will be their "optimum strategy for

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survival" in the new age of technological innovation. He says there are limits to the manpower, money and hardware of small- and medium-scale enterprises, compared with big businesses.

Whenever one visits groups of pioneer companies in the interchange of technologies, they say such interchanges require "hungry spirit" and prompt action. This is the very characteristic of groups of small- and medium-scale enterprises.

Kosaku Iida, president of Beritas, quit a large enterprise and established his own company, which has prospered by coordinating technological interchanges among companies of different categories. He says: "Since a large enterprise is divided into several vertical societies and lacks hungry spirit, it has only weak power to develop unique technologies suited to a new age. According to my own experiences, each division of certain big business is keeping its technologies idle. Such divisions dislike technological interchanges because they want to distinguish themselves in technological development. When I proposed the expansion of a non-textile division of a leading textile company, the personnel in the company flatly rejected the proposal since it had been made by an outsider. A group of 20 middle-class executives of a major shipbuilding company has been asked by the top executive to work out within three years an idea for expanding the non-shipbuilding division at a cost of ¥2,000 million. I was surprised to have been asked by the group to help them because they could not hit upon any good idea after the lapse of two years."

However, big enterprises have recently begun to eye with interest the technological interchanges among small- and medium-scale enterprises.

Is it not because they have realized their own weak points in this new age of technological innovation? In fact, such major firms as Omron Tateisi Electronics and Daifuku Machinery Works, which have been eager to develop technologies, highly evaluate and conduct the technological interchanges among small- and medium-scale enterprises.

Coordinator

It is said that the technological interchanges between firms of different categories are progressing through the process of the acquaintance between enterprises (the exchange of information), the mutual utilization of the other (mutual utilization of technologies) and joint creation (joint development of new products), in this order. To take a closer look at this process, a tie-up is decided or an alternative plan is chosen following the grasping of each other's business character, evaluation of managerial resources, analysis and evaluation of managerial functions, strategic examination of resources and functions to be complemented and evaluation of effectiveness of the tie-up in the light of managerial strategy. In the process of entering into a tie-up, the firms concerned make approaches to each other or respond to such approaches, examine the terms of contract and negotiate. In the case of a group of companies, they select a leader, work out a project on the formation of a group, conclude a contract and lay down rules.

What follow are the establishment of a system of interchanges between firms of different categories, enforcement and evaluation of the contents of tie-up, formation of an organization and improvement of rules, re-examina-

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tion and re-planning of the project and the expansion of the merits arising from the systematization. The technological interchanges between enterprises of different categories surely produce excellent results, but it is required to follow steps and solve problems involved.

The biggest problem is whether it is possible to find a suitable coordinator. Although there is hardly any problem in a tie-up between two firms, the combination of a group of more than three companies requires a good coordinator who is healthy and has sound judgment and good character. Most groups of companies which have been conducting interchanges for a long time picked as coordinators managers who are enthusiastic about coordination and unobtrusive. On the other hand, a group in Yokohama, which was faring well under a good coordinator, was dissolved after he was killed in a traffic accident.

A coordinator occupies such an important position. But it is desirable that besides the coordinator, there will be such assistants as experts on technology, accounting and law, and managers who can express candid opinions to other members. It will be better if there is a good balance in the age brackets of members.

The success of the Marimo Group in Kawaguchi, Saitama Prefecture, is attributed largely to the composition of its members. The group made a start in 1974 when eight machinery and metal processing companies got together. The group has jointly developed more than ten kinds of products, such as the large gear tooth testing machine, high-speed automatic rack cutting machine, automatic *Kushidango* (spitted dumpling) making machine and the machine for stretching gut on tennis rackets. These prod-

ucts surprised large enterprises with their efficiency and low prices. Member companies are enjoying business prosperity and have built new plants or have plans to expand facilities. Other makers in Kawaguchi, a recession-plagued city of cast iron production, are envious of the group.

In the case of the Marimo Group, member companies do not exchange any specific contracts on joint development projects. In the joint booking of orders, a company which received the order asks other companies to make an estimate of cost and to undertake production. But, in case conditions are not met, the order is transferred to outsiders. The long life and excellent achievement of the group are attributable to the character of its representative, Masao Hashimoto, who is the president of Hashimoto Iron Works, and the existence of a good assistant and an adviser. They are Kenji Nakada, an engineer who has quit a leading machinery maker; and Takemasa Kaneko, president of Asahi Hoko-sha.

Nakada says: "Since we speak out to each other, people from the prefectural government once said we were always quarreling and our group would not last long. The success or failure of interchanges among companies of different categories depends, after all, on how to maintain contact of hearts of members." It appears that the operation of the group is flexible because the members include both founders of companies and second-generation presidents.

Patience

President Morimasa Arakawa of Nado Research Institute says: "It will take at least ten years before the technological interchanges among firms of different categories bear fruits. Any

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attempt which does not give thought to the long time required will surely fail." The institute is a member of the "Study Group on Market Research and Technological Adaptation," which is coordinated by Osaka Scientific Technology Center. The institute has developed a system for marking flaws on steel bars and tubes, jointly with Konan Camera Research Institute, which is a member of the "Study Group on Managerial Strategy for High Value-Added," also backed by Osaka Scientific Technology Center.

The new system born out of the docking of a chemical company and a machinery maker is in great demand from leading metal and machinery makers. But Arakawa says it took a total of ten years to jointly develop the system — five years after the two presidents met, three years for development, and two years before the new system began selling.

The foregoing Small and Medium Scale Enterprises Development Center has, as the parent body, a group of member companies of the Association of Small and Medium Scale Enterprises, which is more than 25 years old. The Marimo Group is also a gathering of enterprises united by a moral movement.

A report on the research on the improvement of the system for promoting technological interchanges among firms of different categories, published by Osaka Scientific Technology Center in March, says such interchanges bear fruits five years or more after the start, judging from the results of inquiries into the existing groups of companies. But, the report says there are some cases where member companies got hints on business or caught the needs of clients two to three years after the start of technological interchanges.

Cooperation

Since it takes a long time to get excellent results of technological inter-

changes, there are also points to be checked, other than problems related to men.

An expert lists the following ten points as secrets of succeeding in cooperation among enterprises. They are the leadership of the system organizer, the understanding of the significance and specific character of a tie-up, the independence of individual enterprises, the existence of ability that can be offered, clarification of the aim of the tie-up, careful selection of partners or members, powers to plan, organize and control, clarification and putting in writing of rules, cooperative and give-and-take spirit among all those concerned and the evaluation of the merits of the tie-up from a long-range viewpoint and in perspective. These points also apply to the technological tie-up among companies of different categories.

It is also important to pay attention to the manner in which the Government backs tie-ups. Any group of companies says that a tie-up will not succeed if the Government tries to give guidance and that the matter should be left to private companies. It also says that if the Government backs up a tie-up, it is necessary to allocate budgets for it for a long time and to keep officials in charge of it in the same posts for a long time.

Whether voluntarily carried out by private firms or guided by the Government, interchanges among companies of different categories, centered on electric, machinery and metal makers, will spread to other industries. Small- and medium-scale industries, the Government, and local autonomous bodies will have increased expectations of the interchanges as something to replace the existing cooperation between companies and venture business. But the way to the successful technological interchanges among firms of different categories is not smooth.

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SCIENCE AND TECHNOLOGY

WORLD'S LARGEST COAL LIQUEFACTION FACILITY TO BE DEVELOPED

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 6

[Text]

The New Energy Development Organization plans to start building the world's largest coal liquefaction demonstration plant with 500 ton-a-day coal processing capacity as early as fiscal 1983. NEDO's plan, formulated after suspension of solvent refined coal II project, calls for conceptual design work to be completed by the end of this fiscal year and detailed design by next year.

Three liquefaction efforts will be combined into the single demonstration plant project, making it a major program along with the joint Japanese-Australian plan for brown coal liquefaction.

NEDO and the Ministry of International Trade & Industry decided to try the demonstration plant construction by utilizing the technical SRC II data, which Mitsui SRC Development Co. has so far obtained. The MITI "Sunshine" project called for scaling up liquefaction research and development into 250-ton-a-day plants. But the Ministry judged that larger demonstration plant capacity was desirable to commercialize the R and D efforts. The projected size is twice as large as the Exxon Donor System, which is being experimentally run in the U.S.

The large project will incorporate know-how being

developed by three groups: Mitsubishi (solvolysis process), Sumitomo (solvent extraction) and Nippon Kokan K.K.-Hitachi Zosen Co. (Hitachi Shipbuilding & Engineering Co., direct hydrogenation).

Parties concerned agreed that fiscal difficulties will not allow promotion of all three different technologies. Their processes are similar enough to be incorporated into a single technique, they also judged. The new plant will combine the advantages of the three routes, with all Japanese companies engaged in liquefaction research urged to form a single consortium.

The current pilot plants' capacity is limited to 1 ton a day in terms of coal consumption. Nippon Brown Coal Liquefaction Co. will soon start construction of a plant with a daily coal requirement of 50 tons in Victoria, Australia.

Both NEDO and MITI regard coal liquefaction as a most promising alternative energy source in the 1990s. The Japanese Government's long-term energy supply program calls for obtaining 22.6 million kiloliters of liquefied oil in fiscal 1990. If this coal is realized — although SRC II suspension is likely to delay it — liquefied coal will account for more than 3 per cent of the country's total primary energy supply.

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SCIENCE AND TECHNOLOGY

WORLD'S CAR ELECTRONIC SOPHISTICATION RACE GROWS

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p. 7

[Text]

The era of international competition for attaining more electronic sophistication of passenger cars seems entering its second round with all makers feeling more strongly that their plans will determine the international rating of their products in the future.

The new round of such competition among General Motors Corp. and Ford Motor Co. of the U.S., Toyota Motor Co., Nissan Motor Co. and lesser automakers of Japan, and Volkswagenwerk A.G. and Daimler-Benz A.G. of West Germany is also closely connected with the world's small car war already getting into full swing.

According to industry sources, GM has a head start in the new technology war as indicated by its recent start of efforts to gather all sorts of electronic knowledge applicable to automobiles from both American and foreign enterprises on top of its efforts to build up its own car electronic device production capacity.

GM so far had been purchasing most of the semiconductors needed for application of electronic devices to its cars from Motorola Inc. But it recently started producing its own semiconductors.

Furthermore, GM has started seeking the cooperation of Japan's Toshiba Corp. and Mitsubishi Electric Corp., among others.

GM already expanded, among its 1981 models introduced in autumn, last year, the number of its vehicles with microcomputer-controlled engines, and has followed it up with greater efforts to produce still more electronically sophisticated cars in greater quantity.

Ford Motor, on its part, has decided to start marketing in the U.S. America's first 16-bit microcomputer-controlled engine cars among its 1982 models to be introduced during this autumn. For such a drive, the company seems to have intensified its technological ties with Intel Corp., another leading U.S. semiconductor maker.

Volkswagenwerk and Daimler-Benz are said to be planning to seek technological cooperation and product supplies from Japanese automobile and electric-electronic manufacturers.

In Japan, Nissan Motor Co., spearheading Japan's equivalent drives since the late 1970s, and Toyota Motor Co. have both started gearing up their efforts in competition with GM and Ford. In the case of Nissan, it reportedly has started to produce its own semiconductors, but Nissan still buys them from Hitachi, Ltd. and exchanges technology with it.

More significantly, Nissan has started its own efforts to

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develop large-scale integration for greater sophistication of its cars already far outnumbering Toyota's products in terms of electronic modernization. During last fiscal year, more than 40 per cent of Nissan's cars domestically marketed were of electronic types.

Toyota has made Nippondenso Co., its car electrical equipment producing subsidiary, start expanding its semiconductor division.

This Japanese drive has come to involve even smaller automakers, including Honda Motor Co., Isuzu Motors, Ltd., Fuji Heavy Industries, Ltd., Hino Motors, Ltd., and Suzuki

Motor Co. Honda Motor, long ignoring such "electronification" from its own technological ingenuity, is also planning to start marketing its own new car series with a 16-bit microcomputer controlled type.

During fiscal 1980, Japanese output of cars with electronic fuel injection systems reached 788,000, to account for 30 per cent of the total.

Since the start of this year, Japanese automakers have marketed 11 new series with various electronic devices and are likely to introduce more from this autumn. By sometime next year, half of their total car production could be of electronic type.

Electronic-Controlled Cars Unveiled in Japan

Start of Sales	Car's name	Maker	Systems equipped
February, 1981	Soarer	Toyota Motor	Electronic engine control device
March, 1981	Pulsar	Nissan Motor	Expansion of electronic gasoline injection device
May, 1981	Piazza	Isuzu Motors	Electronic engine control device
May, 1981	(Truck)	Hino Motors	Electronic engine control device
June, 1981	Subaru Leone	Fuji Hi	Electronic fuel supply and speed control devices
June, 1981	Audi Coupe	Audi NSU (West Germany)	Electronic fuel injection device
June, 1981	Stanza	Nissan Motor	Expansion of electronic gasoline injection device
July, 1981	Celica XX	Toyota Motor	Electronic engine control and running control devices
August, 1981	Skyline	Nissan Motor	Electronic engine control and running control devices
August, 1981	Crown	Toyota Motor	Electronic control device is applied to transmissions
August, 1981	Starlet	Toyota Motor	Device for saving fuel at the time of idling
September, 1981	Accord	Honda Motor	Auto version of plane automatic piloting device (under planning)

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SCIENCE AND TECHNOLOGY

PRICES OF 64K RAM CHIPS DROP

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 9

[Text]

Prices of 64-kilobit random access memory (RAM) chips have been plunging remarkably since their appearance only a year ago.

The 64K RAM is the first-generation product of so-called very large-scale integrated circuits (VLSI), featuring highly-advanced microelectronics techniques.

According to industry sources, a 64K RAM now sells for ¥2,000 on a long-term contract basis, only one-tenth of the sample price of ¥20,000 offered in autumn, last year. Industry men say that the price will continue to drop further to below the ¥1,000 level next year.

64K RAM mass-production plans announced in succession by Japanese and American semiconductor manufacturers are one of major factors for the drastic price plunge.

In anticipation of a further downward spiral of prices, computer builders, peripheral equipment makers and other major customers of 64K RAMs are holding down their purchases, causing an "excessive supply" in the market.

Suppliers thus will be forced to review their business strategies for 64K RAMs.

Transactions of 64K RAMs, however, are still very slim.

At present, makers of personal computers and peripheral equipment are the biggest customers. But they buy the highly integrated chips only in a lot of 1,000 units a month. Prices are set on a quarterly or monthly basis. According to a semiconductor dealer, only several tens of thousands units are now on the market.

Another factor that makes people wary of buying 64K RAMs is their still low evaluation of the memory chips as to efficiency and quality. They prefer the earlier-made "reliable" 16K RAMs to the 64K to avoid possible defects. Actually, the price of four 16K RAMs, equivalent in capacity to a single 64K RAM, is almost the same as that of a 64K because a 16K RAM now sells for ¥200-300.

At present, semiconductor makers are racing to establish 64K RAM mass production techniques to vie for larger shares of the VLSI market. Not a few of them, however, seem to have faced difficulty in raising production yields to a commercially feasible level.

The current market price of 64K RAMs, which came down in expectation of mass production, does not necessarily reflect the true situation, some industry men hold.

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SCIENCE AND TECHNOLOGY

SEMICONDUCTOR PRODUCTION RISES IN FIRST HALF OF 1981

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 9

[Text] Semiconductor production in the first half (January-June) of 1981 rose 24 per cent from the year-earlier level to ¥491,617 million, according to the Electronic Industries Association of Japan.

The association, which compiled the figures from the Ministry of International Trade & Industry's production statistics, ascribed the rise mainly to brisk demand from manufacturers of video tape recorders, color TV sets and office automation equipment.

Semiconductor exports, however, dropped 2.5 per cent to ¥119,876 million because of poor demand from the U.S. and major European countries. Imports gained 6.5 per cent to ¥71,320 million. Both export and import figures are based on the Finance Ministry's customs clearance statistics.

Semiconductor output broke down into ¥175,516 million for discrete semiconductors, up 27.1 per cent, and ¥316,101 million for integrated circuits, up 22.3 per cent. The rate of increase of discrete semiconductors topped that of ICs for the first time in several years, the association said.

Production of linear ICs, a major component for VTRs and audio equipment, shot up 45.8

per cent, while bipolar-type digital ICs, used mainly for computers, also recorded a remarkable gain of 36.6 per cent. In contrast, MOS (metal-oxide-semiconductor) digital ICs, which had been pulling the IC industry, gained merely 10.2 per cent. The slowdown was ascribed to the plunge in prices of 16-kilobit random access memory (RAM) chips, which are one of representative MOS-type digital ICs. In unit terms, output of MOS-type digital ICs gained 44 per cent, the association said.

Noteworthy is that exports of unpackaged discrete semiconductors increased 25.6 per cent because semiconductor makers hastily shipped them in the form of silicon wafers mainly to their assembly plants in Southeast Asia. A part of them re-entered Japan in product forms, as shown in the 40.2 per cent gain in diode imports and the 34.3 per cent rise in transistor imports.

Exports of packaged ICs dropped 9.9 per cent, while those of unpackaged ICs gained 19 per cent. The association attributed this to greater

production in the U.S. of Japanese semiconductor makers.

Imports of unpackaged ICs rose 11.8 per cent as some American semiconductor makers have been stepping up assembly in Japan.

**Production, Exports & Imports
of Semiconductors in
1st Half of 1981**
(In millions of yen)

	PRODUCTION	
Total	491,617	(+24.0)
1. Discrete semicon-		
ductor elements	175,516	(+27.1)
a. Diodes	26,842	(+34.3)
b. Rectifying devices	28,982	(+11.7)
c. Transistors	70,947	(+35.0)
d. Thermistors	2,782	(+24.9)
e. Varistors	3,449	(+60.2)
f. Thyristors	10,628	(+4.6)
g. Photoelectric		
conversion devices	28,684	(+32.6)
h. Others	3,242	(-7.2)
2. Integrated circuits	316,101	(+22.3)
a. Semiconductor ICs	286,820	(+22.9)
1. Linear circuits	86,586	(+45.8)
2. Digital circuits	200,234	(+15.1)
i. Bipolar	44,130	(+36.6)
ii. MOS	156,104	(+10.2)
b. Hybrid ICs	29,281	(+16.2)
1. Thin-film ICs	3,574	(+9.1)
2. Thick-film ICs	25,707	(+17.2)
	EXPORTS	IMPORTS
Total	119,876	(-2.5)
1. Discrete semicon-		
ductor elements	33,830	(+5.9)
a. Unpackaged	5,501	(+25.6)
b. Diodes	6,519	(+9.6)
c. Transistors	11,588	(-3.9)
d. Others	10,222	(+7.1)
2. Integrated circuits	86,046	(-5.5)
a. Unpackaged	16,384	(+19.0)
b. Packaged	69,662	(-9.9)
Note: Percentage change from the year-earlier level in parentheses.		
Source: MITI and Finance Ministry.		

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SCIENCE AND TECHNOLOGY

BRITISH TO SET UP MINIFAX VENTURE

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 9

[Text]

A Japanese-British venture to produce the Minifax — small facsimile communication systems for home use — will be set up in Britain as sought by the British Government.

This is because six Japanese companies which jointly developed this system with Nippon Telegraph & Telephone Public Corp. (NTT) recently approved a proposal for such a venture made to NTT by the British Government.

The project stands to become the first instance of Japan's cooperation with Britain in such a technology intensive industry area. Many hope also it will help do away with the frequent trade frictions between the two nations over Japan's overactive exports.

An official contract to start the joint venture is expected to be signed before the end of September on the occasion of a forthcoming visit to Japan of Keith Joseph, British Secretary of State for Industry, because the approval of the plan and accompanying conditions decided by a recent meeting among NTT and the six Japanese com-

panies have been immediately made known to the British authorities through Ichiro Yamanouchi, Japanese Minister of Posts and Telecommunications then touring Britain.

The six Japanese companies are Matsushita Graphic Communication Systems, Inc., expected to represent the sextet in the joint venture, and Toshiba Corp., Nippon Electric Co., Hitachi, Ltd., Fujitsu Ltd., and Tamura Electric Works, Ltd.

Intended for wide popularization of the facsimile communication facilities, like telephone, radio and television sets, the Minifax system features, among others, cheapness in production cost and price. The average production cost is no more than ¥100,000 a set, compared with anywhere between ¥600,000 and ¥3 million for big conventional sets used by industrial corporations and other organizations.

The British Government has taken much interest in the Minifax and decided to introduce such facilities into its

planned electronic mail system in Britain for message senders and receivers to contact each other in facsimile-printed words through the telecommunication network of British Telecom (BT).

In its request, the British Government reportedly named Matsushita Graphic Communication Systems as a partner in the joint enterprise, possibly either with the Ministry of Industry or BT. The Matsushita group of Japanese companies led by Matsushita Electric Industrial Co. has been found to have best contributed to the British industrial redevelopment efforts.

The British side is said to be planning to let the Japanese hold the managerial initiative in it.

The six Japanese firms have approved the venture on condition that 1) the joint enterprise produce only the group's so far developed mini type of sets up to 148 by 210 mm in paper size, and consult the Japanese side for approval if it is to enlarge such sets to the international standard facsimile paper size of 297 by 210 mm, and 2) the joint firm will have a monopolistic right to sell the Minifax facilities only inside Britain.

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SCIENCE AND TECHNOLOGY

JAPANESE, SWISS FIRMS FORM VENTURE FOR CARBON FIBER MATERIAL

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 12

[Text]

Asahi Chemical Industry Co. and Ciba-Geigy A.G. has agreed to jointly produce and market composite materials based on carbon fibers by setting up an equally-owned joint venture in Japan as early as September. Their negotiations started last fall and led to an agreement that they will build a plant at Asahi Chemical's Moriyama, Shiga Prefecture, works by the spring of 1983.

The joint venture will produce the so-called "honeycomb cores," special textiles, sheets with carbon fiber pre-impregnated — all from carbon fiber. The products will be marketed through the Swiss partner's marketing network, too. Applications of these goods include aircraft, and leisure goods.

The Asahi-Ciba-Geigy tieup was conceived as a means by which Asahi Chemical intends to advance into carbon fiber products after its activities lagged behind that of Toray Industries, Inc., a major producer of acrylic fibers (from which polyacrylonitrile carbon fibers are made). Asahi Chemical tied up

with Nippon Carbon Co. to form their joint carbon fiber venture in Tokyo. It is scheduled to complete a carbon fiber plant with monthly capacity of 15 tons by the autumn of 1982.

Meanwhile, Toray will raise its carbon fiber capacity from 35 tons a month at present to 105 tons a month by mid-1982.

To catch up with Toray in the carbon fiber field, Asahi Chemical chose Ciba-Geigy for its strong position in production of epoxy resin, which is indispensable for carbon fiber's composites. In addition, the Swiss firm is experienced in composite materials' development and product design, not to mention its access to aircraft makers.

Integrated production — not just carbon fibers but also composites — is said to hold the key to increasing consumption of carbon fibers. The tieup, intended for Asahi's integrated carbon fiber operation, followed the basic agreement of Toray with Elf Aquitaine and Union Carbide to set up a joint venture in France. (See JEJ August 18 issue.)

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NISSHO TO ENTER BIOTECHNOLOGY INDUSTRY

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 12

[Text]

Nissho Iwai Corp. has decided to venture into biotechnology, including "sales" of Stanford University's patent rights in Japan and owning a partial interest in Cetus Corp.

Of trading concerns here, Mitsui & Co. have so far virtually monopolized biotechnology business by arranging deals between U.S. venture biotechnology capitals and Japanese firms — a position Nissho Iwai plans to threaten.

Stanford's patent officials already visited Nissho Iwai to brief the trading company about the university's biotechnology patents and genetic engineering research situation. The trader arranged so that more than 20 companies could

share the briefing.

Those companies which commercialized products by means of genetic engineering will have to license Stanford patents for exporting them to the U.S. Taking note of the fact, the trader plans to serve as a go-between so that companies here can license Stanford's biotechnology patent rights.

In addition, Nissho Iwai is negotiating with Cetus to acquire a part of its capital. If direct investment is impossible, then it will try to form cooperative tieup relations featuring funding by Nissho Iwai of research funding. Cetus developed a process (bioreactor), designed replace a part of the petrochemical industry with the new biotechnological route.

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SCIENCE AND TECHNOLOGY

NEW TECHNOLOGY PRODUCES CHEAPER STEEL DEOXIDIZING FERROSILICON

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 13

[Text]

A new method to produce steel deoxidizing ferrosilicon that reduces power used by at least 20 per cent has been developed by Japan Metals & Chemicals Co. of Tokyo.

The leading Japanese metallurgical and chemical manufacturer said its new method, developed under subsidization by the governmental Research Development Corporation of Japan, has brought technological inquiries from Canada and elsewhere, besides winning the governmental corporation's official recognition of success.

According to the company, production of refined ferrosilicon with an electric furnace in Japan had so far required 9,000 to 10,000 kilowatt hours of electric power per ton.

The company is said to have succeeded in reducing such electricity consumption to 6,800 kilowatt hours a ton in the net at its principal Wakagawa ferrosilicon factory in Iwate Prefecture.

By the best conventional production method, silica ores are heated up to 1,700 degrees Centigrade for refining in the electric furnace. But the furnace is open at the top and the surface of each lump of ore is kept at a

temperature of around 350 degrees C. Ferrosilicon melted from each lump and coming onto the surface hardens to prevent the escape of the greater heat inside.

The company renovated the method by turning the furnace into a semi-closed type by placing a water-cooled lid on the furnace top to keep the ores' inside temperature at 1,700 degrees C. and their surface temperature at 900. Because of such a high surface temperature, ferrosilicon does not solidify on the surface, to increase the electric power's working efficiency. This has lowered the per ton power consumption from 9,000 to 8,500 kilowatt hours.

In addition, a 5,000-kilowatt power generator built alongside the furnace last year-end has started supplying 4,600 to 4,700 kilowatts of power by making the most of the furnace top heat of about 900 degrees C. This has meant a 20 per cent recovery of a total of 23,000 kilowatts of electricity needed for operating the furnace. Thus, another 1,700 kilowatt hours (about 20 per cent) was cut down from the first-reduced 8,500 kilowatt level.

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SCIENCE AND TECHNOLOGY

HARD, TENSILE TYPE GLASS DEVELOPED

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 13

[Text]

A new kind of industrial and scientific glass proving to be the hardest, and yet one of the most tensile of its sort, has been created by the National Institute for Researches in Inorganic Materials of the Government's Science and Technology Agency.

It's new product is a kind of oxynitride glass containing lanthanum, a rare earth element.

The new glass, chemically identified as La-Si-O-N glass, produced from lanthanum oxide (La_2O_3), silicon oxide (SiO_2), and silicon nitride (Si_3N_4), mixed at the rate of 2 parts, 1 part and 1 part respectively, besides being extremely tensile, is much more than twice as strong as the conventional kinds of glass.

It is also colorless and transparent and easy to mold into a fibrous form. It thus promises wide applicability, including the making of a compound industrial material intensifier like the glassfiber to

be mixed in the reinforced plastics, and windowpanes of highpressure chambers and vessels. Its initial high cost of production could be sufficiently lowered through mass manufacture.

Creation of such a strong, high-tensility glass is known to have been attempted by American, British and West German glassmakers, research institutes and universities in different properties. But all such attempts have been common as to the use of nitrogen as a key to increase the hardness and tensility.

The Japanese governmental institute's new product features a nitrogen content of 18.2 per cent, the highest nitrogen inclusion ever known. Hitherto, the highest content of the kind had been about 8 per cent for a trial product of the Stanford University research institute, of the U.S.

According to the Japanese institute, its new glass was developed by a team led by Akio Makishima, the institute's chief researcher.

The mixture, in a powdered form, of the three kinds of material is pelletized at a

pressure of 300 kilograms per square centimeter. The pellets then are placed in a high temperature and high pressure furnace made of carbon. The furnace then is filled with a nitrogen gas, and its internal pressure is raised to 30 atmospheres, and the pellets inside are melted down at a temperature of about 1,700 degrees C.

The La-Si-O-N glass thus obtained after 15 to 30 minutes of melting process has come to have such a high nitrogen content because the pellets were melted down in an atmosphere full of nitrogen, and compared with other methods using the normal atmospheric pressure, there was little chance for escape of nitrogen through its gas dissolution by heat.

By the Vicker's hardness test, the new product has proved to resist up to 1,220 kilograms per square millimeter of pressure, compared with about 1,100 kgs per square mm for so far the hardest of its kind produced by the Stanford institute though less than 3,000 for the white sapphire crystal cover glass for deluxe quality watches. Ordinary types of glass attains only 500.

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SCIENCE AND TECHNOLOGY

HUGE ELECTROMAGNET INSURES STABLE CURRENT FLOW

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 13

[Text]

A huge electromagnet that defies the destructive effects of powerful electric currents has been experimentally developed by a group of national university, governmental research institute and industrial researchers.

The achievement, that could find wide applications, if refined, especially to energy development projects, such as nuclear fusion and electric power storage researches, was attained through cooperative studies among Prof. Shigeki Mori of Tsukuba University, Prof. Yobi Hirabayashi and his team of the Education Ministry's National Laboratory for High Energy Physics, and researchers of Hitachi, Ltd., and Hitachi Cable Ltd.

The group explains that an electromagnet produces a strong magnetic field with only a weak electric currents if refrigerated down to about 270 degrees below zero C. according to the known principle of metals' loss of electrical resistance at such an extreme temperature. The National Railways' float-and-run (magnetic levitation) super-speed railway vehicle runs by a linear motor utilizing such an electromagnet cooled with

liquid helium.

But when a strong electric current is sent through such an electromagnet to produce a very strong magnetic field for energy development, there must be some high-efficiency heat-absorbing material to cover the magnet because the great heat generated by that current passage destroys the magnet's superconductivity, to cause a quenching phenomenon.

The group attained its success by using a 99.9 per cent pure kind of aluminum as the principal heat absorber. It has built a test electromagnet as a bundle of thinner-than-hair lines of a niobium-titanium combination material about 1 meter long and thick, and first surrounded the circumference of the magnet with the same amount of copper, and then wrapped up the whole sides of the copper-covered bulk with such aluminum 24 times as much as the magnet.

The latest testing results were so good that the passage of a 6,000-ampere electric current, 1,500 more than originally specified, has created a magnetic field of 1.5 Tesla, 30,000 times the earth's magnetism, without a trace of the quenching phenomenon.

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AMORPHOUS SILICON SOLAR CELL TO BE COMMERCIALIZED

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 13

[Text]

A new amorphous silicon solar cell that attains a photovoltaic efficiency of between 7.5 and 8.5 per cent will be commercialized shortly by Kanegafuchi Chemical Industry Co.

The Osaka chemical company said the new solar battery was developed at its Central Research Laboratory by Yoshihisa Owada with the guidance and cooperation of Prof. Yoshihiro Hamakawa and Assistant Hiroaki Okamoto, of the Faculty of Engineering Science, Osaka University.

It said that even its new cell's minimum photovoltaic efficiency of 7.5 per cent tops the two preceding world records — 6.5 per cent set in 1980 by the same research team of Prof. Hamakawa, and 6.9 per cent set in March, this year by the central research institute of Sanyo Electric Co.

If its new battery is chemically treated for eliminating light reflections, it

will attain 8.5 per cent or even more, it said. This will exceed the ultimate target of 7 to 8 per cent set by the Ministry of International Trade & Industry in its solar cell development policy.

The secret of its new achievement, the company said, was its development of a hydrogen-containing thin filming of silicon carbide.

To prepare for commercialization of the new cell, the company will build soon a pair of pilot plants — one for establishing a basic manufacturing process inside its central research laboratory and the other for developing different ways of application to meet all sorts of demand at its Sakamoto factory in Shiga Prefecture.

Initially, the company plans commercially to produce the new cell for various portable applied solar cell products, such as watches and electronic calculators.

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SCIENCE AND TECHNOLOGY

WAY TO DOUBLE EFFICIENCY OF HEAT EXCHANGERS DEVISED

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 13

[Text]

Heat transmitting capacity of gas-liquefying condensation heat exchangers can be increased at least 120 per cent by a new high-voltage electric current flashing method developed by a Japanese government research laboratory.

The method was recently perfected by the Mechanical Engineering Laboratory of the Ministry of International Trade and Industry's Agency of Industrial Science and Technology.

According to the laboratory at Sakura Town, Ibaraki Prefecture, its EHD (Electrohydrodynamic) method is being refined further toward an ultimate aim of increasing heat conductivity by 400 per cent or five times as high.

A condensation type heat exchanger turns the heat-carrying gas medium into a liquid through condensation, separating and emitting heat. The process has had the drawback of requiring a large structure if a high rate of heat transmission is wanted, posing problem of expense for construction and operating costs.

The basic trouble is interference in the heat transfer through the heat-exchanging metal panel by constant formation of a thin film of liquid, about 0.1 millimeter thick over the surface of the panel in the gas-condensing chamber.

The institute has successfully removed most of that liquid film by installing a few slender lines of some highly electrically conductive metal a few millimeters above the panel surface and flashing an electric current anywhere between 5,000 and 10,000 volts through the gap between the surface and the wires from one electrode to another. Such heat medium is usually electrically nonconductive, that is, unresponsive to electricity. Even so, it is attracted by the run of high-voltage current, and its liquid film on the panel surface falls off toward the metal wires.

The necessary electricity consumption, however, is no more than 1 watt for each job because only 0.1 milliampere is needed for a high-voltage flash. The method promises economic feasibility.

The laboratory envisions wide applicability, noting it as method to many kinds of heat exchangers including those of geothermal heat and seawater surface-depth temperature difference types of electric power generators. A University of Tokyo professor has taken interest in the method for its wide applicability noting it as possibly the first successful substantiation of a classic concept for controlling liquid or gas movements with an electric field.

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SCIENCE AND TECHNOLOGY

BRIEFS

BIOTECHNOLOGY INDUSTRY GROWTH--Biotechnology industries will grow into a ¥4.2-6.8 trillion market annually 20 years from now, the Ministry of International Trade & Industry predicts. It concluded that no adverse effects will be generated by biotechnological industries. The conclusion, reached by a biotechnology committee, encouraged MITI to make aggressive policy to help biotechnology grow as an industry. The group, consisting of scholars, businessmen, consumers and experts from MITI's Fermentation Research Institute, studied the possible impacts of biotechnology on society and industries. [Text] [Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19, No 972, 15 Sep 81 p 12] [COPYRIGHT: 1981, the Nihon Keizai Shimbun, Inc.]

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